Volume 57 Number 0

math NEWS

δ $\sin \pi = 0$ $\sum_{i=1}^{n} x_i = \infty$

UW MATH

α $I = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

$\bigoplus$ $\lim_{n \to \infty} x = 0$

$\pi \simeq 2$ (for small values of π)

$x \in X$

$\log xy = \log x + \log y$ γ β

frosh issue 1991

Messages From the Math Societies

Two different streams of MathSoc require two different councils. The President (and Executive) are elected from time to time by the Math students at large. Each is responsible for running the affairs of the Society during the term(s) of his/her election. Among the many duties of the office is the welcoming of Frosh...

Harish Pawagi
Pres. Spring 1991

Hello and welcome to the University of Waterloo!

Now that you're here, you're probably wondering what the hell is going on. First of all, you are now part of one of the largest student societies on campus: The Mathematics Society.

The Math Society is made up of every undergrad math student on campus in a given term. The Math Society is organized and maintained by volunteers. Volunteers help run all the services and events that MathSoc provides. The services MathSoc offers include old exams, math novelties, photocopying, a Coffee and Donut shop, lockers, and *math*NEWS. Events include roadtrips, Orientation, speakers, tournaments, barbecues, and other social and academic gatherings. Who can be a volunteer? You can!

You can start your university career by meeting other enthusiastic people who like being involved in more than just school. You can help out by being an office worker, you can join MathSoc Council (and have a hand in the BIG decisions) or you can volunteer to help whenever you are available throughout the term. There are always events needing fun people to run them. Talk to your Big Brother or Big Sister to find out more!

By the way, for all you 8-streamers, I'm the guy who will be in charge when the Winter '92 term starts. So look out for me during Frosh Week.

Good Luck in your first term in the Faculty of Mathematics!

Harish Pawagi, President
Markus Baumann, Vice-President
Kevin Boyes, Treasurer

Dee Vint
Pres. Fall 1991

Congratulations on deciding to come to one of the finest Mathematics schools in North America.

You have probably made up your mind on what you want to study. All I have to say is leave all of your options open. In your first year you will be exposed to many new and exciting fields of mathematics, so keep an open mind and watch out for information night put on by MathSoc and the Faculty. If you haven't made up your mind, don't despair, we're here to help.

As soon as you get here, and through your university career, you will notice various rituals. Some customs which should be treated with respect are the Pink Tie, the Natural Log, and MathSoc. These all make up an "integral" part of being a Mathie.

The Pink Tie is a proud display of Mathie-ness! It stands for knowledge, power, zaniness and it is a replica of one of the most outrageous ties worn by prof Ralph Stanton.

The Math Society is one of many organisations on campus but we represent you! The Mathie! We are a group of dedicated Mathies that uphold traditions, sponsor clubs, and offer services to make your time at University better.

MathSoc supports many clubs: Applied Math, Pure Math, Accounting Students, Act Sci, Computer Science, and Teaching Students. These groups offer talks and social events to further interests in their area. So if you want to participate, or just want to talk to someone, go by the third floor and say hi.

To make your first week and last year here the most memorable, MathSoc sponsors Orientation and the Math Grad Committee. Start and leave with a bang!

Office workers volunteer one hour per week and get to know what's going on. We also need your participation at our social events.

Life at university is what you make it, so make the most of it. One piece of advice: University is very different from high school. For one thing, you'll have weekly assignments. When the work load gets high, there is a temptation to copy assignments. DON'T ! The only person you are fooling is yourself. You'll never get caught up - you say next week I'll get it done - but somehow next week never comes. Then it's exam time and you don't know the material. And then what? If you're having problems, there is help: the profs, teaching assistants, the Tutorial Centre and MathSoc.

The few, the proud, the mathies!

Dee Vint, President
Derrick Campbell, Vice-President
Mike Abramczuk, Treasurer

P. S. It's my goal to meet each and every one of you during Frosh Week so come out and say 'hi'!

LookAhead

Important Dates for Fall 91

Date	Details
Sept. 3–6	Orientation and Registration
Sept. 3(10:30 a.m.)–20	OPERATION MATHSTART (MC 5158)
Sept. 4	Faculty Orientation Program
Sept. 4 (10:00 a.m.)	"Advanced/Honours" Special Meeting
Sept. 4 (7:00 p.m.)	ELPE in the PAC
Sept. 9	Beginning of Lectures
Sept. 20	End of ADD a course period.
Oct. 4	Deadline for dropping a course.
	Deadline for Advanced-Honours transfers.
Nov. 6–8	Pre-registration for Spring Term.
Dec. 3	Lectures end.
Dec. 6–20	Final Exam Period.

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Editor: Marcel Goudeseune, Betty-Jo Hill, Rick McTavish

From The Faculty

I am pleased to have the opportunity to extend my greetings to the first-year class in this year's Orientation Issue of *math*NEWS. I want to welcome you to the Faculty of Mathematics and wish you every success in your program of studies at the University of Waterloo. There is a tremendous variety of things to learn and do here, and many personal adventures await you as you initiate and progress through your undergraduate career.

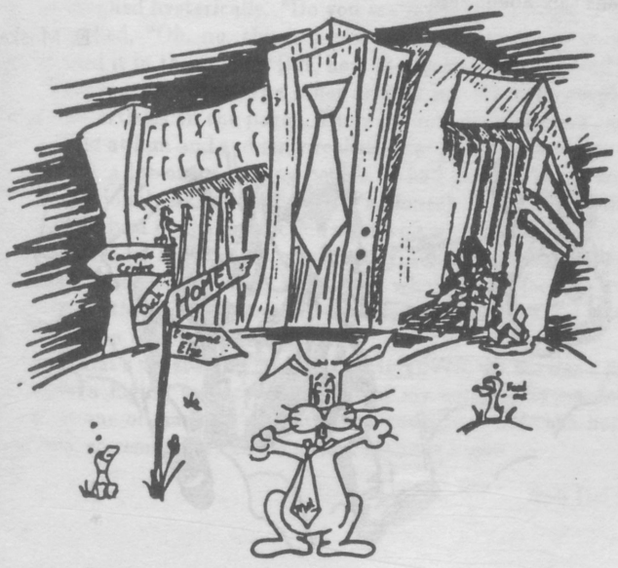
I am sure that one of the advantages that attracted you to the Faculty of Mathematics is the wide range of mathematical and computer-related courses available to you during your undergraduate program. Over the next four years, you have a wonderful opportunity to learn about many areas of the mathematical sciences as well as about disciplines in other Faculties across campus. I hope that you will exploit this opportunity to gain a broad base in and appreciation for the mathematical sciences. At the same time, I hope that you will expand your horizons and include in your program several courses from another area. This can provide a potential field to which you can apply your knowledge and skills in the mathematical sciences. The University has much to offer in both academic and extracurricular activities and I hope you will endeavour to involve yourself in the larger community.

There is always a period of adjustment as students adapt to the greater independence of University life. It is now your responsibility to develop and adhere to a study schedule which keeps you on top of your academic work. You will be required to develop a firm grasp of the theoretical bases of the subjects that you study and to apply that knowledge in solving problems. To be successful, you must be willing to delve deeply and strive always for understanding. In teaching, our aim is to help to direct your enquiries and to encourage you to learn. Learning is hard but rewarding work and it is your responsibility.

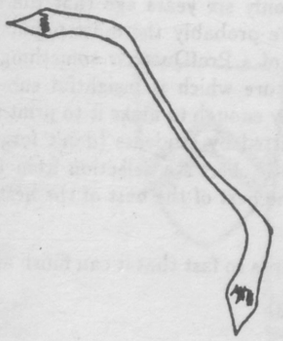
My office is on the fifth floor of the MC building in the south west corner. Along the same corridor are the offices of Professor John Wainwright, the Associate Dean for Undergraduate Studies and of Professor Ron Dunkley, the Associate Dean for Faculty Programs. The Mathematics Undergraduate Office is nearby. We are here to help so that if there are areas of concern to you as Math Faculty students, please let us know.

I wish each of you success in your academic work and hope that your time at the University of Waterloo will be a period of intellectual and personal growth. Welcome to the Faculty of Mathematics.

J.D. Kalbfleisch
Dean of Mathematics



J.D. Kalbfleisch
Dean of Mathematics



John Wainwright
Associate Dean, Undergraduate Studies

I would like to extend a warm welcome to you all as you begin your first year at the University of Waterloo.

Your first experience at the University in the Fall will be Orientation Week. One purpose of orientation is to provide an opportunity for you to meet some of your fellow students and faculty members. There are two activities that I would like to mention.

OPERATION MATHSTART, which begins on Tuesday, September 3, will assist you with registration and scheduling problems. Even if you haven't encountered such problems, the MATHSTART centre is also a good place to meet other students and faculty members in an informal atmosphere.

MATH DAY, on Wednesday, September 4 is jointly sponsored by the Faculty of Mathematics and MathSoc. The day-long program includes breakfast with the Dean, various question-and-answer sessions, and a barbecue.

Lectures begin on Monday, September 9. You will be faced with a number of challenges. You will find that the material is covered at a faster pace than in high school, and that the problems require careful thought, rather than the straight-forward application of a formula. You will thus have to work harder that you have ever done before. Most people have difficulties. Discuss problems with your fellow students, possibly at regular meetings, and keep in mind that you can also consult with your professors. The secret is to start working as soon as lectures begin, so that you don't fall behind. Then you will do justice to your studies, and still have time for social and sporting activities.

I wish you every success in your university life.

John Wainwright
Associate Dean, Undergraduate Studies

Prof Quotes

It was only six years ago that the first ProfQuote was submitted, but they're probably the most popular feature in mathNEWS. The definition of a ProfQuote is something that an actual prof said in an actual lecture which is insightful enough, ambiguous enough or just plain funny enough to make it to print in mathNEWS. All ProfQuotes are submitted by students (don't forget to submit yours!). To whet your whistle, here's a selection from the best of the best (does that make it the best of the best of the best?) ProfQuotes.

"A Cray is so fast that it can finish an infinite loop in three minutes."

P.A. Buhr

"Don't insult 1; it can't help it if it's its own square."

C. Cutler

"If I have not answered your question in 20 minutes, then I'll give you, uh, five cents."

I. McGee

"My, isn't this lovely data. Everyone should have data like this."

C. Cutler

"Then someone comes up to you and says, 'use the Cauchy-Schwartz inequality, Luke.'"

C. Cobourn

"I don't know why people are laughing, is my fly open or something?"

M. McKiernan

"So here's an example using infinity-by-infinity matrices. Leave lots of room on your page."

P. Hoffman

"Styles are changing all the time. I don't like that. It means I have to buy a new tie every year."

R. Dunkley

"Put up your hand if the person beside you doesn't understand."

I. Munro

"You can bring any calculator you want to the midterm, as long as it doesn't dim the lights when you turn it on."

G. Heppler

"If my wife's giving me a hard time then you'll all fail."

J. Baker

"There is more to relationships than linear things."

A. Brendar

"I never have to remember that formula; I don't have to write the final exam."

P. Hoffman

"You can check that out on your pocket tool."

R. Wentzell

"It's not my fault that 20 years ago your parents couldn't find a drugstore that was open."

L. Smith

"You should not be concerned by the fact that the constants are variables."

S. Lipshitz

"Everytime I talk about the beauty of math they look at me like I'm senile or something. . . or worse."

R. Dunkley

"So helium is what I call a happy atom."

F. Goodman

"Sequences and series aren't that tough. All you need is a bottle of scotch and an hour."

P. Ponzo

"What's the definition of a computer? An accountant with a personality."

B. Gosselink

"Zero is about halfway between $-\infty$ and $+\infty$."

F. Zorzitto

"Pure mathematicians have wet dreams over this stuff . . . don't quote that in mathNEWS; I'm in enough trouble already."

I. McGee

"I looked at the Final the other day and I'm happy to see that we covered some of the material."

C. Cutler

"We'll try this with the girls on top and the guys on . . . Let me rephrase that."

T. Kroetsch

"Physicists talk about nothing, Artsies talk about nothing, but mathematicians talk about zero."

E. Moskal

mathNEWS
What is it?

mathNEWS is your newspaper! mathNEWS, funded by MathSoc, has a mandate to entertain and inform U(W) mathies and anyone else who has the good fortune to come across a copy of mathNEWS. mathNEWS comes out every other week (every third week during the summer) on Friday mornings at 8am. mathNEWS is *the* preferred distraction from your Friday morning classes.

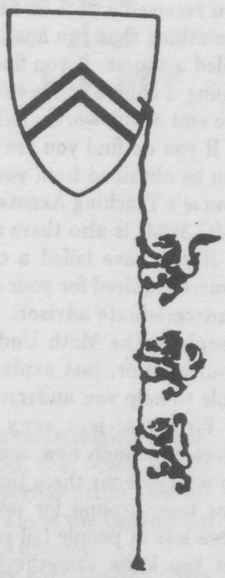
mathNEWS, however, is only as good as those who put it together *(currently quite excellent -ED)*. So come out some Monday night if you've ever wanted to see your work in print, or help put together a masterwork that will be cherished until the end of time, or at least until the next issue comes out. We need people to write articles, type them in, cut and paste them together, and eat the pizza we order every production night. If you've never worked on a newspaper before, don't worry! We'll teach you how to use UNIX, LaTeX, and exacto knives, as well as how to eat pizza.

Watch for posters advertising our organizational meeting during frosh week. We'll be choosing an editor(s) at this meeting as well as filling several semi-official positions on staff. If you'd like to help out, show up at this meeting, or leave a note in the mathNEWS office MC3041. Come on out and be a part of mathNEWS!

Stephen Smith

Hierarchy of Life

Mathies
The Natural Log/The Pink Tie
mathNEWS
C+D
Coke Classic
MathSoc
Bombshelter
Fed Hall
Calvin and Hobbes
Blue Jays
Math Frosh
SCOOPS
HP Calculators
Cinema Gratis
π
8:30 classes
Other Frosh
η
TA's
Campus Sculptures
The William G. Davis Centre
Engineers
High school down the road (WLU)
New Coke
EngSoc
ξ
Kitchener Transit
Dept. of Co-operative Education and Career Services
High school down the highway (Guelph)
Village "Food"
IBM
Needless Hell
Keeners
Imprint (Imp'tint)
Artsies
UWO (Western)
The Tool
Hierarchies of things



My Life as a mathNEWSwriter

I used to be a dull, boring, poor excuse for a human being. My life had no direction. My biggest thrill was differentiating logarithmic functions on a Friday night.

Then, one day, a friend of mine asked me to come out to a mathNEWS production night. I replied, "But I can't write anything! I'm just not good enough." He said, "That's OK, we probably don't need you for anything. I just need a ride home."

Despite his remarks, I put together a small article and showed up the following Monday at 7 P.M. As luck would have it, the friendly editor was impressed. He smiled and said, "This is great!" It was the first time anyone had said anything of mine was great. My self-esteem was on the rise.

I showed up to the next production night with another article. The editor laughed hysterically. "Do you really think it's funny?" I asked.

He replied, "Oh, no, this is a piece of garbage," as he crumpled it and tossed it in the trash. "But, hey, there's lots of other stuff you can do. We need people to type other articles in. We need people to lay out these articles on the pages. There are lots of things you can do."

I looked at him and suddenly realised that production nights are fun. I had met a lot of interesting people. I had eaten a lot of free pizza (the traditional mathNEWS staffer's dinner). And, above all, I had gotten involved in the production of one of the greatest publications of all time just by showing up one Monday night. It was a great feeling, knowing that the following Friday the whole Math faculty would be reading mathNEWS (during my 8:30 class, of course) and I was a part of the reason that it could happen.

Well, that's my story. Thanks to mathNEWS, my life has a purpose. I'm now a highly respected member of my community—a dominant figure in one of mankind's greatest achievements. This can happen to you, too, so remember: Come out on Monday night!

Rob Del Mundo

Phone Numbers You May Need

Emergency	911
University Switchboard	885-1211
University Security	ext 3211
Health and Safety	ext 3541
MathSoc	888-4779
	885-1211 ext 2324
Counselling Services	ext 2655
Co-op Co-ordination	ext 4026
Turnkey Desk	888-4434
Kitchener Transit	741-2525
Gray Coach	741-2600
VIA Rail	(800) 268-9520

On Failing

It sometimes happens ...

It's January, 1992. You pick up your first grade report to find that you received a 35% in one of your courses. You have now encountered something that you have probably never encountered before. You have failed a course. If you find yourself in this position, or find that you are failing a course in the middle of a term, remember one thing: It is not the end of the world. Believe me, I know; I failed a few courses myself.

If you do find you are failing a course mid-term, look for help. Help can be obtained from your friends in the course, the professor, and the course's Teaching Assistants. If it is a math course, the Tutorial Centre (MC 3004) is also there to help you when you are in need.

If you have failed a course, especially if it is a math course, or a course required for your degree, I would suggest that you seek out your undergraduate advisor. If you don't know who that is, ask the nice people in the Math Undergraduate Office (MC 5115). When you see your advisor, just explain your situation and your advisor should be able to help you understand the implications of the failed course.

First year is a *very* traumatic time for some people. There are already enough new and confusing things in your life without having to worry about these things called classes. The University of Waterloo has been around for over 30 years, and the administration here has seen lots of people fail courses and still graduate. Failing a course will let you know something about yourself that will help you deal with your problems in the future. Look at it as another learning experience (groan).

I am not saying that failing a course is a good thing, and most of you won't fail any courses, but just remember that if you find yourself in trouble: seek some help and either get out of that trouble or find out where you stand. You may panic over nothing and get yourself in bigger trouble.

Good Luck in September.

Rick M^{c}Tavish

Did You Know...

Did You Know...
(a.k.a. The UW 91-92 Undergrad Calendar)

1. ...the Imprint "is dedicated to the intellectual analysis and coverage of the news, arts, sports and issues of the day."
2. ...the whole rest of the world thinks a dot means the end of a sentence, while we know it represents a workterm.
3. ...an objective of the Federation of Students is "to act as the representative of the students."
4. ...Newfoundland, Hong Kong, India, and Central and South America are the only regions listed from where you already have to have completed at least one year of university to gain admission to UW. (Are we good or what?)
5. ...if you are good, the Senate of the University could confer an honorary Doctor of Divinity Degree on you.
6. ...the Faculty of Mathematics has 8 miscellaneous policies covering 7 areas. This is more than any other faculty; actually about 8 more.
7. ...if you open the calendar exactly in the middle you can read all about your favourite faculty. No, not Science.

Problem Solvers

Where to go for help

University is going to be a new world to you and with it comes new problems to be solved (calculus assignments excluded.) Here's an article to show you where to go and who to ask when these problems arise.

The first problem solver you will encounter will be your big brother or big sister. Once upon a time, they had the same questions answered for them, probably by their big brothers and sisters. They are willing to help you during and after orientation week. MathSoc is another place to go for help throughout the term. Although the friendly office worker may not know the answer, he or she will probably know where you can find it.

Questions dealing with your courses or future in math are best directed to your faculty advisor. OPERATION MATHSTART is set up in room MC 5158 to be your registration and scheduling problem solvers in the first days at school. Starting Tuesday, September 3, MATHSTART should be a necessary stop for all students with problems that should be tackled right away. These professors will be able to guide you through course selections and academic problems a student in the prof's particular field may encounter.

General questions about math and the university procedures are best directed to the Math Undergraduate Office on the fifth floor of the MC building, room MC 5115. They may direct you to the Registrar's Office on the second floor of Needles Hall room (NH 2001), though, if it is a question dealing strictly with the University.

Across the hall from the Registrar's Office is Counselling Services, room NH 2002. Here, professional counsellors will be able to help students with their concerns about school, life, or their futures. The Chaplain's Office in room MC 4002 offers the same type of help in a spiritual manner if you so prefer.

The Ombudsman is a counsellor of the pseudo-legal variety. He or she is on campus in the Campus Centre, room CC 235, and is approachable free of charge by appointment for any student wishing legal help.

Any question or concern you have can be answered by using one of the services mentioned here, but only you can search them out.

mastHEAD

Well, this is the fourth Masthead I've started with the word 'well'. This issue has been about 3 days in the making, and it's about time it was finished. Actually, it's taking us longer to choose music and pizza than to lay out the entire issue. And now for something completely different. The masthead is the section of the paper where I [we, the editors] get to list those who helped out with the issue. In this case, this includes people who have helped out in past years. Also, this article will *not* appear on page 2, as most of the grammar actually makes sense. I think that's enough in-jokes for this masthead.

Here are the people who came out (with their year and major, high school and home-town) to make this thing. Recognize anyone?: Rick McTavish (4C C&O, Huron Park S.S., Woodstock, Ont.), Curtis Desjardins (4A C&O (Confusionatorics & Obliteration), the now-defunct Welland High & V.S., Welland, Ont.), Monse Villanueva (Grad, Huron Park S.S., Woodstock, Ont.), Marcel Goudeseune (1B AM/CS, St. Michael's Choir School, Mississuaga, Ont.), Betty-Jo Hill (3A ActSci, Marymount College, Sudbury, Ont.), Shannon Mann (3B Independent Studies, Norwell D.S.S., Palmerston, Ont.), Rob McTavish (3A Bus. Opt., Huron Park S.S., Woodstock, Ont.), Michael Reade (2A CS, Earl of March S.S., Kanata, Ont.), Rob Del Mundo (3A OR, West Hill, C.I., Scarborough, Ont.), Camille Goudeseune (Grad, St. Michael's Choir School, Mierlo, Brabant), and karen 'snark' smith (4A Anth., Episcopal H.S., Baton Rouge, La.).

Thanks also go to 97.7, and to Marion and Graphics Services.

MathSoc

What is MathSoc?

MathSoc is the student society to which every math student belongs. The society is active in all areas of math student life: from the faculty level right on down to the frosh. MathSoc uses your $7.50 fee to provide all kinds of services and events for its members.

Where can I find MathSoc?

The MathSoc office is located in MC 3038. This room is the hub of all MathSoc activities as well as the best place to go when you have any kind of problem. If we don't know the answer, chances are we know someone who does.

What does MathSoc do?

Free services provided by MathSoc to its members include: a telephone, change ($$), lost and found, a mail drop, copies of old exams, five cent photocopies, lockers and use of the Macintosh computer equipment. Across the lobby is the Comfy Lounge and the C+D where you can get food and drink at very reasonable prices. MathSoc runs an individual quiet study room and a group study room on the fourth floor. MathSoc also sells buttons, recycle mugs, pencils, and shirts for a low price.

In addition to these services, MathSoc also organises social events. These range from bands at Fed Hall to Blue Jays road trips to Oktoberfest tickets to BBQ's and more. All of these events are subsidised somewhat by your fees and so are considerably cheaper than you might expect.

Who does all of this stuff?

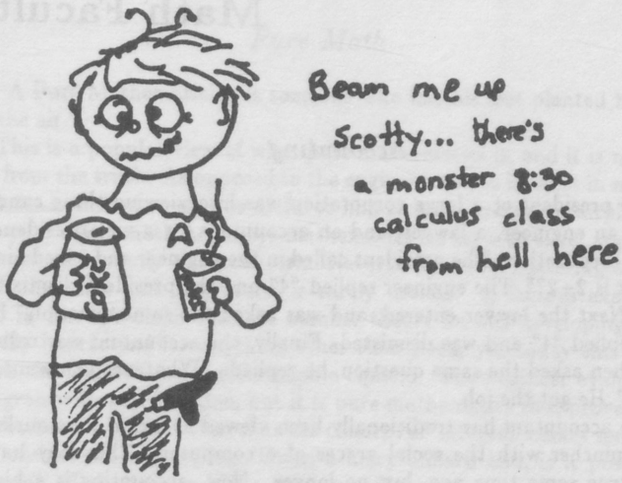
As you might guess, lots of people are needed to staff the office and help out with social events. These people, all volunteers, are called (cleverly enough) the office workers. Office workers spend an hour or more a week just sitting in the office and acting as a well of information and assistance to anyone who comes in. You don't have to know much to be an office worker, just where the staplers are and who's next in the chain of command if you can't answer someone's question. It's a great way to start to getting involved with the Society. Just sign up for an hour on the MathSoc office door and show up for that hour.

Who's really in charge?

MathSoc itself is run by the MathSoc Council. This council consists of three groups: the elected executive, the appointed executive, and the class reps. The elected executive (the President, Vice-President, and Treasurer) are the ones ultimately in charge of what MathSoc does. The appointed executive is appointed by Council near the beginning of term and includes, among others, the Social Director, Council Speaker, Recycling Director and Office Manager. You should speak to a member of the executive or leave a message for them in the MathSoc office if you're interested in one of these positions. Class reps are elected by each class (1st year regular, 3rd year co-op, etc) at the beginning of each term. The next election (and your chance to be elected to the MathSoc Council) will be during the first three weeks in September.

Where do I sign up?

If you're interested in becoming a part of this campus' most exciting and dynamic student society, MathSoc is for you. You can get involved to any degree you want, from office worker to elected council member. The demands on your time aren't bad, and you'll meet a whole bunch of people who are as interested as you in having the best time possible while at good ol' U(W).



The Pink Tie

Waterloo leads the world (or at least Canada) in technological education. We can boast about leading the fashion world, too. Many people have taken to wearing pink ties as part of their everyday attire. Waterloo started this fashion trend. You see, the Pink Tie is the (un)official mascot of the University of Waterloo Mathematics Society.

How did Waterloo start this trend? As the story goes (passed down from grads to frosh over the decades), there once was a particular professor of mathematics who loved to wear outlandish gaudily-coloured ties. One of these ties was mostly pink with strange lines on it. This particular professor also happened to be the foundjng dean of the fledgling Faculty of Mathematics, lending some importance to his attire.

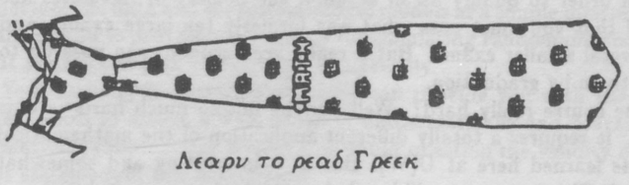
Mathematics students, being the unconventional bunch they usually are (and we hope you are no different), seized the wonderful opportunity for being irreverent but non-destructive and chose a tie as their official symbol, and pink as its official colour.

During the construction of the Mathematics and Computer building in November 1967, some of the aforementioned math students decided that the new building was a monstrosity and could use some decoration. (Some people still say that. Then they go and design the Davis Centre—it's even worse!) Late one Sunday night a few weeks later, a handful of brave mathies found their way on to the roof of the brand new building. On Monday morning the campus awoke to see an 85-foot Pink Tie hanging from the roof!

MathSoc adopted the tie, and inherited the dry-cleaning bills, until the tie was stolen for a final time and irreversibly desecrated by heathen engineering students. A second Pink Tie was commissioned and served faithfully until September 1986, when it was paint-bombed. (Some people have no sense of decorum.) This year you will see the most recent Pink Tie hanging from the Math building when you arrive for Orientation Week.

The Pink Tie is a symbol of the Faculty of Mathematics and the Math Orientation Committee. *math*NEWS has adopted the Pink Tie as the symbol of all things good and mathematic. (MathSoc's official symbol is the Natural Log, but the Tie perseveres regardless!) As the legend of the Pink Tie lives on, it is commemorated in the fashionable item of clothing you wear as a Waterloo Math frosh. Wear the Pink Tie with pride.

dwarf



Math Faculty Programs

Accounting

The president of a large corporation was interviewing three candidates, an engineer, a lawyer, and an accountant for a vice-presidency in the corporation. The president called in the engineer and asked him: "What is 2+2?" The engineer replied "4" and the president dismissed him. Next the lawyer entered, and was asked the same question. He also replied "4" and was dismissed. Finally, the accountant was called in. When asked the same question, he replied: "Whatever you want it to be." He got the job.

The accountant has traditionally been viewed as a dull, humourless pennypincher with the social graces of a computer. This may have been true some time ago, but no longer. Now, accounting is a high profile, high demand, high paying profession which opens up avenues to a multitude of careers, only a few of which are actually in the accounting field.

The first choice you must make once you have entered the MATH/CA program is between the financial (CA) and managerial (MA) branches. Although there is very little difference in the courses you choose (Only one in four years), the major difference arises in the types of jobs you will do, and upon graduating, the exams you will write.

Financial accountants are responsible for "providing an independant assessment of the statements in terms of their fairness and conformity with generally accepted accounting principles" (the dreaded GAAP word), and management accounting assists in "planning, controlling and evaluating within an organization."

There is the Accounting Students Association (ASA) formed by both the Math and Arts programs. The ASA holds many social events, sponsors sports teams and brings in people from the accounting field.

The MATH/CA program is not an easy program. You need good marks to get in and to stay in. But, if you want to write your own ticket once you graduate, this is the way to do it.

Actuarial Science

An actuary? Huh? What's that? Don't be upset if you don't know - most people don't, and presumably you're reading this to find out. Actuarial science is a rarity, being both a mathematical field of research and a valuable way of gaining employment.

So what does it involve? The role of the actuary is presumably to predict financial gain and loss positions several years into the future. As a result, the actuarial science program studies, in some depth, probability theory and theory of interest. This is the sort of analysis that applies well to insurance situations. (How long will they live? How much will we have to pay them?) So you find almost all actuaries working for insurance companies or private consulting firms. They play an important role in pricing of products, as well as determining the valuation of financial reserves.

"Did you mention something about jobs?" As a matter of fact, yes. Actuaries always have, and will continue to be in demand. Employers certainly appreciate the scarcity of actuaries, and are quite willing to compensate them appropriately. But, there has to be a catch, right? Well, in order to qualify as an actuary, the Society of Actuaries has deemed that you must pass what was formerly ten large exams, and now several smaller exams. But a really keen student can pass up to half of them by graduation.

Is the course really hard? Well, maybe not so much hard as it is unique. It requires a totally different application of the mathematical concepts learned here at U(W). But is is interesting and somewhat practical. Give it a try, you'll be glad you did when you graduate.

Applied Math

Applied mathematics is the study of mathematical methods for solving physical problems. While this may sound a lot like engineering, there is a crucial difference. Engineering concerns itself with the actual physical problems and seeks to find quantitative answers to those problems: applied mathematics is concerned with the mathematics involved in finding those solutions and seeks to further knowledge about the mathematics, or to discover new methods of solution. An applied mathematician must be able to 'stand back' from his solution and see where it fits in the universe of mathematics. Applied mathematics is thus a bridge between the mathematical world and the physical world. Despite the difference, there are strong ties between applied mathematics and the world of engineering and the natural sciences, and much overlap. Many graduates of the applied math program go on to work in engineering or the natural sciences, especially in the theoretical aspects.

Applied math is full of differential equations: one may even say that applied mathematicians are partial to differential equations. If you don't know what a differential equation is, don't worry. You will see more than enough differential equations in your applied math courses to learn what they're all about, and see how useful they are in describing physical phenomena.

If you find the physical world to be an interesting place, and like to look at it from a mathematical perspective, then applied mathematics may be the program for you.

Business Option

Hi, I am here to tell you about the Business Administration option under the Division of Mathematics for Industry and Commerce. This option offers the following courses during your four years at University: Financial/Management Accounting, Introductory Business, Marketing, Micro/Macro Economics, Business Law, Managerial Finance, Managerial Science, Personnel Management, and Business Policy. The Business option is an excellent education to gain because it opens a lot of doors for interesting and challenging jobs upon graduation in a business world which is growing and has need for mathematically inclined business graduates.

In first year, you will be required to take BUS 111/122 and ACC 121/122. You can also, in first year, take other Business courses mentioned in the Undergraduate course calendar. BUS 111/122 are introductory business courses which are taken at Wilfred Laurier University and ACC 121/122 are Financial Accounting and Managerial Accounting.

All BUS courses will be taken at Wilfred Laurier University. The grey building called the Peter's Building on the corner of University Avenue and Albert Street is where all the Laurier Business courses are taught. Non business students are always asking me how I can handle the long trek to Laurier all the time. First of all you get used to travelling to Laurier all the time for your classes. Secondly it really isn't that far. In your first month or so, the distance between Laurier and U of W will shorten up. The Peter's building is probably the closest building on the Laurier campus to the U of W campus. In some cases you will have only ten minutes to get from U of W to Laurier or vice versa, but this amount of time should be adequate if you don't dilly dally. Most people walk but Laurier is equipped with bike racks and parking lots if you choose other methods.

So, if you are looking for a program that is both challenging and extremely interesting, then choose the Business option, it's the right choice.

continued on page 9

continued from page 8

Computer Science

(See the article called *CS or Not CS* on page 10)

Combinatorics and Optimisation

Explaining what C&O is all about is quite an undertaking. Your best bet when trying to explain it to your parents is "It's just math, mom." However, we can't get away that easily. Waterloo has the first C&O department in the world. C&O is certainly more than 'just' math.

Combinatorics is a diverse field, involving many subject areas. The first two you will encounter (in C&O 230) will be graph theory and enumeration. Graph theory deals with ways to solve problems through pictorial methods. Transportation problems, organisational models, computer science algorithms and more can be studied through graph theory. Enumeration is counting theory, dealing with ways to combine items or form patterns, from something as mundane as making change to highly esoteric theories.

Optimisation is the modelling of problems, subject to boundaries and constraints, to yield the best possible solution. The practical upshot of this is that optimisation methods, such as linear programming, can be used to predict and account for bridge stresses, to optimize factory floor space and to produce 'best fit' solutions to many complex problems with large numbers of variables.

C&O has long been a special part of Waterloo. The discipline has only developed fully in the last hundred years, and a large part of the work has been carried out by UW faculty. The many areas for research and rapidly broadening horizons of C&O make it one of math's most interesting departments. We may not know how to explain it, but we're sure it can be well worth investigating!

Teaching Option

One of the biggest complaints I hear from students is that whenever they tell a layman that they are in Math, that person asks if they want to be a teacher. Well, some of us actually do want to teach when we graduate, and the Mathematics Teaching Option is the best way to earn your degree and teaching certificate. The program begins in 2A when you go through a set of interviews before you are accepted to the Option. If you are accepted, your stream changes drastically, and you flip between 4 and 8 stream people constantly. Also, you lose a work term but you gain a 4 month term at Althouse Teacher's College at the University of Western Ontario. The reason for the reduced time at teacher's college is that the last three work terms are spent in a high school (or possibly a senior public school) classroom, and by the last teaching work term most students have a full teaching timetable. In other words, you will have 12 months classroom experience and a Math degree. Boards of Education will be knocking down your door to hire you.

The best part about Teaching Option: You get up to 4 Summer School terms.

The worst part about Teaching Option: The salaries are incredibly bad (worse than CA's). If you want money go into Actuarial Science.

Least known fact: You can graduate from Teaching Option by completing any other Undergraduate Major requirements instead of the Teaching program.

Pure Math

"A Pure Mathematician is someone who has his feet planted firmly in the air."

This is a popular view of what pure mathematics is, and it is not so far from the truth. As opposed to the engineer, whose interest in mathematics is limited to what is useful to him to build bridges or airplanes, the pure mathematician enjoys mathematics for its own sake; applications are somebody else's concern. Nevertheless, this puttering about with theorems and conjectures is rarely useless. A famous example is G.H. Hardy's claim that the number theory he was developing was totally impractical for anything other than itself; yet today this provides the foundation for unbreakable ciphers. The engineer evaluates integrals with gay abandon, but it is pure mathematics that proves his methods work (in fact even that the concept of 'integral' makes sense!).

Consider these questions: Given a hairy billiard ball, is it possible to comb all the hair so it lies flat everywhere? How can the concept of prime numbers be generalised from the integers to polynomials, and what analogies can be made between the two? Can every even number be expressed as the sum of two primes? If these questions pique your curiosity, Pure Math is where you'll find the answers. (Well, nobody knows for sure about the last one (yet)). The sheer elegance of mathematics shines at its best here, unencumbered (although often inspired) by the "real world." And while you may consider a theorem to be ephemeral compared to the Brooklyn Bridge, remember that the theorem's truth will far outlast the bridge's lifespan.

Statistics

By the time they graduate from high school, 99.9% of all Canadians have seen enough uninteresting and useless statistics to be skeptical of any politician that trots out a few numbers to bolster her/his argument. This is a good thing. Healthy skepticism is a fundamental attribute of a professional statistician (unlike say your favourite sportscaster who after examining the entrails of countless tabulations merrily predicts all sorts of things). Statistics is that branch of the mathematical sciences which focuses on the development and correct application of the scientific method. The statistician is concerned with answering questions such as: what data need to be collected; how should they be collected to provide efficient, reliable answers to the questions of interest; how can a mathematical model which describes the process that generated the data be described, and verified; how can the data be summarized and presented clearly; what conclusions can be drawn from the data and what is the degree of (un)certainty of these conclusions; what actions should be taken and what are the predicted consequences of these actions; do the data provoke questions which might be addressed by a future study?

The range of applications is enormous: from the predictions of the onset of AIDS for a given individual to determining of the best marketing strategy for a given product; from the reconstruction and recognition of images produced by computer-aided tomography to the improvement of product quality in a manufacturing process. Statisticians are called upon to participate in research areas from anthropology to zoology.

Statisticians need a strong mathematical background, especially in probability theory, and use a variety of mathematical and probabilistic models in their problem solving. Essential to this problem solving is the computer: to perform the sometimes complex calculations necessary; to access and deal with large data bases; to graphically display complex aspects of the data and the mathematical models in a simple informative manner; and to provide a laboratory for simulating random phenomena that are too complex to deal with analytically.

Your training in Statistics at U(W) can provide you with the necessary tools to attack a wide range of mathematically and practically significant problems. For a start you would question the validity of the first statement in this description.

CS or Not CS

"I know software verification sounds a lot like Computer Science, but I don't want a Computer Science major. I want someone who can think. I want a math major."

– an anonymous corporate recruiter

Now that you've been accepted into Math, you may think your decisions are over, but they've just begun. If you haven't already done so, you'll soon have to choose a major. One of the most popular choices is Computer Science. Typically, of the roughly 800 Math Frosh (this means you) entering the University of Waterloo's Faculty of Mathematics, fully half intend to enter Computer Science in their second year. Why is Computer Science so popular? What about the other departments?

For many people, computers were fun and programming came easily in high school. Others feel that in an increasingly technological society, it is necessary—even vital—to become part of the "computer revolution." Still others look to CS because of the apparent glamour and the lucrative job field.

Mathematics, on the other hand, is a labour of love. There is no apparent glamour for a mathematician. People study mathematics because they enjoy studying it, working with it, thinking about it. Many who enter Math at Waterloo without the intention of entering CS are steered here by advice from older friends or enlightened teachers.

What does it mean, both for Computer Science majors and for other Mathies, to have Computer Science and other Mathematics courses so strongly interrelated?

Since the theory of computing is mathematical in nature, CS students take mathematics courses. If they're good at math, they'll be good at the analysis and problem solving needed for higher level computer science jobs, like Systems Analysis. CS majors at UW are not taught specifically how to program, rather how to solve problems and what tools to apply.

In the first one and a half years of study, most honours programs have a basic similarity. By the end of first year, all Mathies know everything that they need to know about programming. Like all Mathies, CS students will be exposed to calculus, algebra, statistics and subjects of that ilk. The required Math courses in CS programs are intended to provide a basic grasp of the tools and methods of each discipline. Not only does this provide a future analyst with a solid background, but it gives CS majors, who may decide to leave the program, exposure to the wide range of mathematical fields available.

By third year, most programs have diverged radically. CS majors may opt at this point for a less mathematically-intensive program (or more so, if they prefer.) All Math programs become more flexible after the first couple of years, allowing for specialisation and interest-oriented study.

Every Math student benefits from CS courses through the resources they make available for study and research. With basic computer knowledge common to their classes, professors can employ the computer as a tool to let students apply the theories they have been studying. More realistic problems can be explored without using contrived examples where every step has an integer result. One does not have to be a CS major at UW to learn how to use computers productively.

The Computer Science program at UW is intended to produce analysts, not merely programmers. People who only want to learn to program should *not* be in a CS major degree at UW, but in CS at a community college. These institutions provide solid programming skills, but few of the tools needed to progress beyond coding jobs. The many Math courses that UW requires are not required there. A more in-depth education aimed at a DP management job or a job at a senior programmer level can be obtained at places like UWO. Beyond that, it is often the Waterloo-trained analysts and problem solvers, for whom coding is a tool used to accomplish a task, who progress.

Professionally, Waterloo Mathies (and even engineers) work well together. Thanks to the interrelated programs, CS grads can work with actuaries and statisticians and applied mathematicians with ease. This ability is denied many others in the CS field.

These are some of the reasons why CS and Math are so closely tied, and why CS majors must take the common Math core courses. UW wants to produce thinkers, not merely doers. Waterloo CS grads do not stay coders for long, but move into the thought-work areas of business as computer science applies to them.

At Waterloo you will be exposed to all the options of mathematics. Computer Science is an exciting part, but not the only area of interest. After all, mathematics has been around for millenia. The classic outsider view of mathematics as boring is far from accurate. The knowledge that there is always more to discover makes it exciting for both the dedicated researchers and the professionals for whom mathematics is a toolkit. Now and in the foreseeable future mathematicians will be developing the ideas that lead to discoveries in science, engineering and humanities—for mathematics is not just a science or technology, but a philosophy as well.

CS is certainly an excellent program here, but only one program among many, all of which are valuable and fun. Bear this in mind as you travel through your years here, and be open to new ideas. The Waterloo BMath is a document which signifies the bearer's ability to reason, to think as well as to do, and to program, no matter what discipline the major reflects.

Stuart L. Hodgins
W. Jim Jordan

St. Jerome's and Mathematics

I'm sure that some of you out there have chosen to study mathematics at St. Jerome's College. Here are a few pointers on what you can expect over the next few years.

St. Jerome's is a church college federated with the University. Students registering in any co-op or regular math programme can enrol at St. Jerome's. Those of you who have chosen the regular system of study will probably attend all of your first and second year core courses (MATH 135/136, MATH 137/138, MATH 235, MATH 237, CS 131/132, STAT 230/231) at St. Jerome's. If you are a Stream 8 co-op, you will take all of your first year and 2A core courses at the college. If you are in Math/CA, your 1A and 2A core math courses will be offered at St. Jerome's. However, those of you who are in 4 Stream will only spend your first term at St. Jerome's. Thereafter, the core courses which you require will not be offered at St. Jerome's during the terms that you are on campus.

Being at St. Jerome's, you will probably find that your classes are smaller in size (approximately 80 students in 1A) than those on the main campus (especially after 1A, when about 25-35% of the class goes on its first work term.) There are no lecture halls at St. Jerome's, and so your classes will be taught in classrooms (unlike the main campus where lecture halls hold about 200 students per class.) This may make it easier for you to adjust to university as the atmosphere won't be too much different than that of high school. It may also be easier to meet and get to know your classmates.

When you are enrolled at St. Jerome's, do make a point of going over to the math building occasionally to visit the C+D, use the library facilities or just to drop by MathSoc and use the stapler. Of course, don't forget to pick up a copy of *math*NEWS on the occasional Friday morning (get there *early* to be assured of your copy). Also, most of the math clubs (eg. AM, CSC) have offices in the Math and Computer building, so drop by and see what's going on.

MED

The Frosh Dictionary

A list of terms you may wonder about

Arts Library (Dana Porter): The main campus library, the big sugar cube at the centre of campus. According to legend, it's slowly sinking due to the weight of its books.

Bombshelter: The original campus pub and party place, a great alternative to Fed Hall, serves pizza for lunch.

C+D: The MathSoc Coffee and Donut shop, a food bonanza full of ice cream, caffeine and pastries at good prices. Located in the C+D lounge (cleverly enough) in the south end of the third floor of MC. Just follow the smell of coffee and bagels.

Campus Centre (CC): Student building between MC and the PAC. Houses SCOOPS and the turnkeys, the Bombshelter and the Wild Duck Cafe.

CIBC: Canadian Imperial Bank of Commerce, campus branch (in the CC). See service charge.

Cinema Gratis: A variety of eclectic and popular celluloid is shown for *free* (hence Gratis) on Tuesday nights in the CC. Good fun, and you can't beat the price.

Co-op Student: A gypsy with books.

DavisWorld : Like the Eaton Centre with computers, DavisWorld is an adventure in colour, a twisty maze of tiny rooms, no two alike.

Endless Loop: See Loop, Endless.

Feds: The Federation of Students, a campus-wide "organisation" that aims (and often misses) to represent the student body. Has useful services like SCOOPS and a cheap bus to Toronto on Fridays.

Fed Hall: The biggest student pub in North America. Serves lunch during the day, and parties at night. Worth getting out to see. It's noisy, but you'll love it. It's open to all U of W students, regardless of age.

Fed Hall Bouncers: Big like tree, smart like rock.

Guelph: The sound a dog makes as it tosses its cookies.

IMP'TINT **(Imprint):** Preprinted birdcage liner, shipped in bulk on Fridays.

Loop, Endless: See Endless Loop.

Math: Your new Faculty, a great place for learning, meeting new friends and generally enjoying a productive and all-too-brief university career.

*math*NEWS: What you're reading now. Math's student newspaper, a bastion of humour, bad puns, a little math, and even less news. Run by student volunteers.

MC: Home. The Mathematics and Computer building, located at the north centre part of campus. It's big, grey and cubic. A block of ice in the summer, toasty warm in the winter.

MC 3038: MathSoc's office, the place to go for social information, photocopies, and copies of old midterm exams.

Natural Log: The *official* MathSoc MathScot, the symbol of our society, essentially a laminated log but we love it anyway.

Needless Hell: (also Needles Hall) a place (and a thing) all co-ops pass through.

Oxymoron: Any set of words with a self-contradictory meaning. Classics include Postal Service, Good Morning, Civil Engineer, and Village Food.

Pink Tie : The other MathSoc MathScot, a symbol also used by the Faculty. Our visible symbol of pride (would you rather wear a twig?).

Recursion: See Recursion.

Rhursday: Day between Wednesday and Friday at UW.

Security: Have flashlight, will travel.

Service Charge: Zero account balance. See CIBC (also see Loop, Endless).

Village Food: Illustrates the difference between well cooked and cooked well. Food fit for a king (Here, King! Here, boy!).

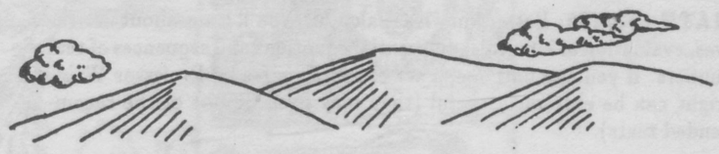
Village One: The closer on-campus residence, laid out like a medium security pen, mostly single rooms.

Village Zoo: The other on-campus residence, deserving of its name, mostly double rooms.

Watpubs: Mobile Bombshelters, pubs held in various Canadian cities once a week for co-op students on work term and UW alumni.

Wild Duck Cafe: The CC dining emporium. See Guelph.

WLU: The high school down the road (Wilfrid Laurier University).



Coarse Selections

Since most of you don't really know what your courses are going to be like, we've decided to tell you what they were like as various mathNEWS staff members have experienced them. Core first year courses and oft-chosen electives are covered here. For information on other courses, talk to an upper-year student. That's another good excuse to make another friend at Waterloo.

ACC 101: Accounting for accountants; this course can be pretty hard. If you haven't taken high school accounting, find someone who has to help you. If you have, you'll still have to work for this one.

ACC 121/122: Accounting for non-accountants. Easy if you have taken accounting in high school. There are some new principles in managerial accounting. These are the non-specialist counterparts to ACC 101.

BUS 111/121: Taught at WLU, these courses teach you the basics about the business world (and the stock market!) Business courses are WLU's speciality, and these two are always well taught.

CHEM 123: Introductory Chemistry. Follows from OAC concepts. Might get nasty towards the end of the term, but it can't hurt. You can take an optional quarter-credit lab with this course.

CHEM 124: This is an introductory course in organic chemistry. It is demanding and requires a lot of memorisation, but is quite interesting. There is also an optional quarter-credit lab for this course.

CS 131: a.k.a. Introductory Mouse Training. Learn how to program in Pascal. This course begins on a light note - introductions to MacDraw, MacWrite and a spreadsheet. Once enough lectures have passed you'll learn such heart-throbbing topics as algorithm efficiency, structured programming and recursion. Labs require preparation work to be handed in, and can be good or bad depending how the servers feel. Lectures are passable and don't coincide with the labs for a while.

CS 132: Advanced Mouse Training. The lectures cover material for you to do in your labs. The first half of the labs are in Pascal, and the last half in C. Learn about the parts of Compilers, Linked Lists, Dynamic Storage and Binary Search Trees, Numerical Methods and Gaussian Elimination. You also learn how to use MAPLE (good for Calculus).

ECON 101/102: Slightly dry unless Larry Smith teaches, but beneficial. Easy to pass. Hard to ace. Lots of graphs, lots of reading (typical artsie course). Provides all the economics a non-major will ever need.

ENGL 109: English. For those of you that fail your ELPEs, it's one way of getting out of trying again. Little take home work, but lots of in-class essay writing.

FR 192 A/B: These courses are taught entirely in French and build upon OAC oral, reading, and writing skills. They consist of three hours of lectures, a one hour conversation class and a one hour listening lab per week. If you are taking these courses, you must write the French Placement Test in September.

MATH 135/136: These are the first year algebra courses. In MATH 135 you will learn classical algebra, a topic that began in ancient Greece. Included are such topics as set theory, number systems and how to send secret messages in a code that's impossible to break. MATH 136 follows from the OAC material on matrix algebra, but it takes it a lot further.

MATH 137/138: Better known as calculus. You'll learn about derivatives, evaluation of integrals, differential equations and sequences of real numbers. If you can find one, a set of course notes by Professor Wainwright can be extremely useful (they may even be one of the recommended texts).

MTHEL 100: An ornithological monstrosity (i.e. bird course.) It deals mostly with contract law but also gives some instruction in the laws of tort and the structure of courts. A great deal of memorising is required to obtain a good mark. There are no theorems, no proofs, just facts to know.

MUSIC 100: Introduction to Music. This is a music appreciation course so you get to listen to a lot of music. Practice quizes help with the course studying. You get to do concert reviews, too.

PHIL 140: Introduction to Formal Logic. It's not so much Philosophy as Introductory Boolean Algebra. Generally easy for Mathies.

PHIL 145: Critical Thinking. This course teaches you how to analyse simple arguments for logical fallacies. It is interesting and not too difficult.

PHYS 121/122: Similar to OAC Physics, you probably won't learn much new in the first term. Second term covers waves, gravitation and thermodynamics. Mathematical and a fair number of formulas.

PSYCH 101: Introduction to Psychology. Register early to get in. Lots of memorisation. Easy to pass.

SCI 205: The infamous 'Hi-Fi-Sci' course that teaches concepts about stereo systems.

SCI 238: Star Gazing, alias Introductory Astronomy. Learn more about the heavenly bodies. Basic math, formula plugging, and a lot of reading.

Financial Assistance

University is a very expensive habit($1339 for most just to come here). Even in the co-op program, some students find it hard to make ends meet. But do not fear, there are sources of income most students can apply for.

The Ontario Student Assistance Program, better known as OSAP, is the largest. Get the proper forms from the Registrar's Office, fill them out, and send them in sometime in September. You may be eligible for a grant or an interest free loan. You can only apply for the first eight terms at school.

OSAP isn't the only source of money. There are numerous scholarships and bursaries available that are often forgotten. Check the Undergraduate Calendar to see if you qualify for any.

If OSAP and other student awards leave you wanting, there are many jobs available on- and off-campus. Beware: jobs cut into study and leisure time.

And Then There Were None

Fees
(and other four-letter words)

When you first looked at your fee statement, you probably noticed several things. You noticed that it was white and dark green. You noticed that it had your name printed on it. Then you noticed the line that said "Balance due Sep 03" and the number beside it: $1338.76 (less if you're in regular study). When you recovered, you probably saw the many smaller fees that make up this whopping total, and wondered what they all were, and more importantly if you really had to pay them all. Well, you don't actually have to pay them all . . .

Fees You Have To Pay

Tuition: This is the basic tuition Fee, which covers the basic costs of the courses you'll take for the next four months. Individual courses may have other costs associated (such as lab breakage cards for chemistry labs), which will be assessed later, but most course costs are covered by this fee.

Co-op Fee: All co-op students pay this fee to cover the costs the university incurs in handling the co-op program. Supposedly, the salaries of co-ordinators (who are supposed to find jobs for students, although it often seems to be the other way around), bookkeeping costs and other items are paid for by this fee. In fact, the university sets this fee, not the people in co-op, so don't complain to your coordinator that you're not getting $312 worth of services. This fee must be paid by everyone in co-op, regardless of whether or not you go through interviews in a given term.

Work Rpt Marking: Co-op students pay this fee. This fee is paid every term, whether or not you submit a work report to mark.

Health Insurance: This insures both you and the university. The health insurance you buy helps cover insurance costs for the university, and you get a discount when buying prescription drugs (even on work terms) and other things. For more details, go over to Health Services and pick up their brochure.

Athletic Fee: This fee funds our intercollegiate teams (football, basketball, volleyball, swimming, etc.) in their support and operation, as well as tournaments and meets.

Federation Hall: This fee goes toward paying off the student pub located on campus near Village 1.

Fees That You Can Get Back Later

The remaining fees can be refunded by applying to the appropriate organisations within three weeks of the start of lectures. Most of these fees support interesting and worthwhile organisations, which are run by and for students. They would love to have you join them and help them out.

Waterloo P.I.R.G.: The Waterloo Public Interest Research Group, WPIRG, is a student funded public affairs group which has studied such things as nuclear waste and acid rain, and brought in speakers such as Ralph Nader.

Radio Waterloo: CKMS 94.5 FM (in stereo) is the student run radio station here on campus, providing a wide variety of programming over a range of musical styles and subject matter.

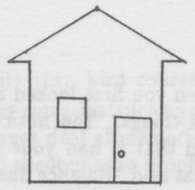
Fed. of Students: All undergraduates at UW can belong to our Federation of Students, the "Feds." They provide lots of services, like Scoops, two pubs, legal services, a word processing service, Fed. Buses to Toronto and more.

Student Society: This is your Math Society fee. MathSoc funds various services and events for mathies. See the article elsewhere in this issue for details.

Imprint: "Imp'tint" is a campus "newspaper" published every Friday. The quality of the paper is directly attributable to those working on it, and the quality goes up and down, but it often contains information of immediate relevance to the student population.

Fees for Fall 1991		
Fee	**Amount**	**Notes**
Must Pay these . . .		
Tuition	$885.00	everyone pays
Co-op Fee	312.00	co-ops only pay
Work Rpt Marking	12.00	co-ops only pay
Health Insurance	26.50	regular students
	49.68	co-op students
Athletic Fee	30.00	school teams
Federation Hall	7.50	
Refundable fees		
Waterloo P.I.R.G.	$3.28	
Radio Waterloo	4.00	
Fed. of students	23.70	
Math Society	7.50	a good deal
Imprint	4.10	

On-Campus Housing



It's very likely that you already have a place to live staked out in Waterloo, so why is this article here? You may want to live somewhere else before your days here are through, and there are quite a few choices.

Church Colleges

Waterloo has four affiliated or federated church colleges which run residences as well. St. Jerome's, sponsored by the Roman Catholic church, is the oldest of the four and has two separate residences: St. Jerome's, for men; and Notre Dame, for women. Renison College is the Anglican college on campus. St. Paul's College, sponsored by the United Church, has a large residence, and Conrad Grebel College, operated by the Mennonite Church, has a smaller residence. Residence fees for each of these run around $2100 per term, with varying numbers of meals depending on the college. Some colleges may have single rooms available.

Waterloo Co-op Residences

The Waterloo Co-operative Residence (WCRI) is student built, owned, and operated, and is located within a five minute walk to the University. WCRI operates independently of the University of Waterloo. Applications are accepted from all students regardless of whether or not they are enrolled in a university co-op program; the word "Co-operative" here means that the residence is owned and controlled democratically by the members who live there.

WCRI has three co-ed residence divisions: Dag Hammarskjold, at 139 University Ave. W., housing 108 students in 18 single rooms and 45 double rooms; Phillip North and Phillip South, at 280 Phillip St., housing 144 students each in a combined total of 96 single rooms and 96 double rooms. Each residence has a dining room where meals are served daily. Each floor has a lounge and a kitchenette where members can make breakfast and snacks with food supplied by the Co-op. All members have access to study, recreation and laundry facilities.

The apartment divisions have a combined total of 16 one-bedroom, 48 two-bedroom, 58 three-bedroom and 35 four-bedroom apartments. Each apartment is equipped with a fridge and stove. Members have access to a piano room, bike room, study carrels, recreation rooms and laundry facilities. Those who choose to live in an apartment may purchase a meal plan.

WCRI's small-community-like atmosphere encourages members to get together for many events such as skating, movie nights, fitness classes and excursions.

Each member is responisible for the cleanliness of his/her own room or apartment, shares reponsibility of the cleanliness for the common areas and contributes towards the operation of the Co-op. By having members do work duties, expenses are reduced, resulting in lower fees. All members have the benefit of claiming their accommodation fees for the Ontario Property Tax credit at income tax time.

The necessity to work together helps create the sense of community which is an integral part of the Co-op experience and by stressing mutual resonsibility, a satisfactory atmosphere for study is maintained.

For further information write to or call:
Admissions Co-ordinator
Waterloo Co-operative Residence Inc.
268 Phillip Street
Waterloo, Ontario
N2L 6G9 (519) 884-3670

Student Villages

UW has a housing office that can be reached through the switchboard (885-1211, if you haven't memorised it yet). They have information about nearly everything related to housing, both in Waterloo and in other cities where co-ops are common (Toronto, Ottawa, Calgary, etc).

The largest on-campus residences are Village 1 and Village 2. Most frosh go into Village 2, which is essentially all double rooms. It is rather noisy—with about 50 people to a floor, parties and stereo wars are not easily contained. Village 1 is arranged in smaller cubical 'houses' with 15 people to a floor, so it's a little more civilised. V1 has almost all single and interconnecting (two rooms separated by a door) rooms. Residence fees are $2150 for a double room, $2248 for interconnecting rooms, and $2311 for a single room. This is a per term rate and includes 21 meals a week.

Off-Campus Living

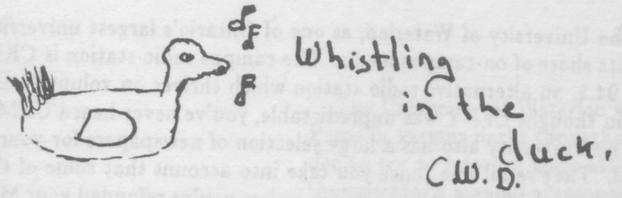
While it can be an advantage to live in the Villages for at least one's first year, living off-campus also has its advantages. It's usually cheaper, and you generally have more room and freedom. You also have more responsibility, with cooking and cleaning can adding a few hours a week to your schedule.

There are many possibilities for off-campus living. You might find a room in a family's home, or have an apartment or townhouse. In any case, the first person you will be dealing with is the landlord. Some are very understanding and can be very obliging. Others can be downright difficult to please. If something goes wrong, consult the legal resources office in the Campus Centre *immediately*. If you're polite to the landlord, pay the rent on time, and obey the rules, you should have no problems.

If you are getting a lease, you may find it necessary to sign for a minimum of one year. You can usually sublet while you're working out of town.

Most places will require you to bring your own supply of sheets, blankets & pillows, possibly furniture and cooking utensils – some may come unfurnished. You should also bring a few of your Mom's recipes to get you started (and maybe a fire extinguisher if it's your first time cooking).

If you haven't found a place yet, keep checking with the Off-Campus Housing Office above Village One. They have housing lists for Kitchener-Waterloo as well as for other large cities in Ontario (for when you go off to work for a few months). Additional rental listings can be found in the *Kitchener-Waterloo Record* and in a flyer called "Read it'n'Rent." Housing boards are located throughout the campus, notably at the Campus Centre, outside the MathSoc office, and in Carl Pollock Hall. The price range fluctuates, but you can expect to pay between $270 and $450 a month for a livable (but not luxurious) place, depending also on furnishings and location. Utilities can be more than $50 a month per person during winter terms, so don't forget to budget for them. Shop around before you take a place, but remember that good deals can be snapped up fast!



Advanced Insanity?

"To be Honours, or to be Advanced, that is the question." This thought may be occurring to you now. For those of you who just checked boxes at random on your pre-registration form without really reading them, there are two different levels of honours Math courses. Most math students choose to take MATH 135/136 and MATH 137/138. There are advanced versions of these courses, MATH 145/146 and MATH 147/148, which are also available. The advanced courses cover the same material as the regular courses, but may not be limited to that material. These advanced courses are more theoretically oriented than the regular honours courses. Don't forget though that MATH 135/136 and 137/138 are challenging enough for most people–they aren't called Honours for nothing.

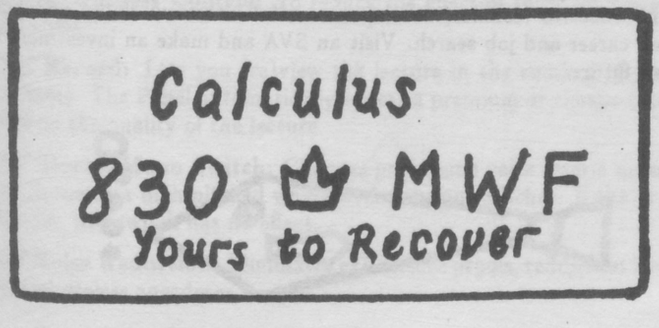
The advantage of taking the advanced courses is smaller classes (50-60), which more easily allows friendships to build and gives a more personal rapport with the professor. The homework will challenge you as much as you want or can handle, and is less mechanical in nature. The courses offer understanding of the "why" of concepts behind a problem, and not merely the "how to" knowledge to solve a problem. As an encouragement to take these courses, the Math faculty has assured students that taking these courses will not significantly change the final marks that they would have gotten in the regular honours sections.

Now, the disadvantages. There is some tendency to lose contact with the rest of the first year students because of the separation of the courses. Furthermore, advanced classes can at first seem more competitive. Because the assignments are not mechanical, students must provide some of their own practice problems, or face difficulties in later senior courses. Finally, there is no official recognition of the advanced honours graduate.

If you enjoy mathematics, such as that on the Descartes, and want a thorough understanding of some basic math concepts, then you should consider the advanced courses. The faculty has set it up so that it's relatively easy to switch from the Advanced courses to the regular Honours courses without doing any other damage to your timetable.

I stuck it out through three terms of advanced honours and I'm glad I did. The deeper understanding I gained helped me in later courses.

Most people in the regular Honours sections felt that their courses were enough work. They believed they would not have survived the advanced courses. Remember—the decision is yours and yours alone.



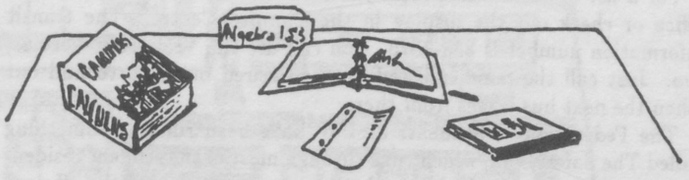
Writing the ELPE

The ELPE is the English Language Proficiency Exam. All first year math students who did not get at least 80% in OAC English must pass this exam once in their University career.

What do you have to do in it? Well, you have to write an essay which is based on a quote that you are given. The content of the essay is not important, the english, however, is. To put it bluntly, you have one hour to bullshit in the Queen's english. But, don't worry if you don't pass it the first time, you have at least eight chances to pass it over the course of your studies here.

If you would rather take an english course, a mark of C- in ENGL 109, 129R, 210A or 210C will also give you credit for the ELPE.

Now, because of the ELPE, you will be able to leave here and say, "Four years ago, I couldn't spell 'mathematician'; now I are one."



The Acquisition of Textbooks

There are basically three ways one can purchase textbooks: from the UW Book Store, from the Used Textbook Store, and through private arrangements. The UW Book Store is located in South Campus Hall, which overlooks the southern entrance of the campus. All textbooks for your courses should be available there. As well, a list of required and recommended textbooks is maintained there. However, you can get a better price by buying used textbooks, and the there is a high probability that you will wait an extremely long time in the line-up to get in. The Book Store is a small place for the volume it has to handle in the opening weeks of the term. Here are some tips for shopping at the Book Store.

First of all, try to shop as early as possible, to be sure you get your textbooks. The Book Store tries to keep sufficient supplies, but it sometimes runs out of textbooks. Keep all of your receipts so that you can get a full refund if you drop a course or if you discover that you've bought the wrong book. There are two types of cashiers: those who handle cash only and those who handle cheque and credit card transactions. The line-ups for the cash cashiers tends to move more quickly than the other line-ups. (more line-ups, sigh!) Finally, the Book Store is partitioned into two areas during the first couple of weeks. Textbooks for math, science and engineering type courses are available on the lower floor of the Book Store. The entrance to this section is located at the back of the Book Store and can be easily identified by the line-up in front of it. The upper floor contains textbooks for the other (i.e. arts) courses, as well as stationery supplies, with access via the main entrance.

Should you wish to save some money on textbooks, there are two options you might consider. One is to watch the bulletin boards for people advertising used textbooks. The other is to check out the Used Book Store, located in the basement of the Campus Centre. However, you should not expect to get all of your required textbooks from these sources. And before you buy, make sure you have the right textbook and the right edition—all sales are final at these places. It's not a bad idea to go to the UW Book Store before checking out these places, so that you know what to get.

CYBERman

Getting Around

Local, Private, Four Wheels

For those driving to school from off-campus, go to security the *first day* you arrive if you hope to get a parking space. If you don't pay the fee to have a spot, get used to paying 50 or 75 cents for daily parking, and remember to have some quarters in the car at all times. If you try to park illegally in loading docks or on the road, you generally have a half hour grace before you get the $25 fine, then another hour before your car is towed.

Local, Public

Public transit in this city is run by Kitchener Transit, often referred to as Kitchener Chance-it. This organisation runs about 15 routes in and around K-W, including UW. It costs $1.20 to ride the bus (bills are frowned upon, so this is a good place to use the loon), but monthly passes are available if you plan to use the bus frequently.

For a list of useful bus routes you can head downtown to the head office or check out the display in the Campus Centre. The transit information number is 885-7373. You can use the "Telerider" service, too. Just call the number listed on the desired bus stop to find out when the next bus leaves from there.

The Federation of Students at UW have been running something called The Safety Van, which runs through most of the student residential areas. This service is designed to encourage women to stay off dark streets and pathways during the evenings; hence, the van is primarily for female students. This is a free service.

Inter-City

Aside from the usual VIA Rail and Grey Coach services, the Federation of Students runs a cheap express bus to Toronto on Fridays and from Toronto on Sundays. The prices are $7.50 one way and $14.00 return.

*math*NEWS' Top Ten Excuses for Late Assignments

10. I had to remove all the vulgarities.
9. I sold the publishing rights on it to Penguin Books and they haven't sent it back yet.
8. Oh, I thought you meant September 22nd *next year*.
7. My horoscope said, 'Harm will befall you if you get everything done.'
6. My friend wasn't done his assignment on time, and I had to clone it.
5. I was too sober to finish it.
4. I have to walk past Laurier on the way here and I was mugged by a bunch of football players.
3. The 'e' key on my typewriter was busted and I had to look in a thesaurus for synonyms.
2. 50 dollars? I thought you said 20 dollars!
1. **I was reading *math*NEWS.**

Campus Media

The University of Waterloo, as one of Ontario's largest universities, has its share of on-campus media. The campus radio station is CKMS-FM 94.5, an alternative radio station which thrives on volunteer DJ's. If you thought CFNY was unpredictable, you've never heard CKMS.

The University also has a large selection of newspapers for your perusal. They're all free (once you take into account that some of them come from the fees that you pay), so unless you've refunded your MathSoc and Imp'tint fee, feel free to pick up a copy of any of these.

Imprint (a.k.a. Imp'tint) is the official student newspaper on campus. It is loaded with opinions, advertising, record reviews and some campus-type news. It appears late Friday morning at various places on campus.

The *Gazette* is the University administration's newspaper. This paper comes out every Wednesday and contains articles of interest to the University community. It takes a generally conservative or sceptical view of things, except when dealing with things that the administration is gung-ho about. The best part about the paper is the Notebook section with one-paragraph tidbits of things (watch for *math*NEWS excerpts).

*math*NEWS (what you're reading now) is funded by MathSoc and presents an interesting mix of information and humour in a magazine format. Unfortunately, resources prevent us from being a real magazine. *math*NEWS comes out on alternate Fridays, usually before 8:30 classes, so you can pick it up and read it in calculus. People have called us the best paper on campus. Find out why.

The Engineering Society (boo, hiss) produces a bi-weekly newspaper called the *Iron Warrior*. This is a generally serious paper containing articles of interest to engineering students and math students taking engineering electives. They deliver a bundle to the Davis Center whenever they come out.

Occasionally the Science Society or the Arts Society gets its act together and publishes its respective newspaper (*Opus* and *The Arts Lion*). Halley's Comet returns slightly more often than these papers are published so don't hold your breath.

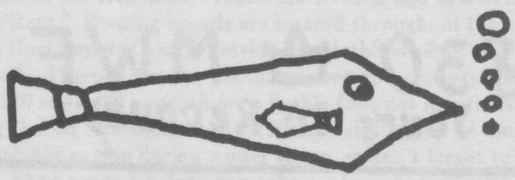
Enjoy the reading. It's a great break from classes.

Student Vocational Advisors

The Student Vocational Advisor (SVA) programme assists students with answers to questions on career planning and job search. The SVA programme provides students with a readily and easily approachable peer resource to help them with all aspects of the job search, whether the job is a summer job, co-op position, or full-time career.

SVAs are students trained in all areas of career planning and job search. SVAs are volunteer students who work closely with Career Services. SVAs maintain weekly office hours within all six faculties. Office locations and hours can be obtained from Career Services in Needles Hall, or from SVA posters located around campus at the beginning of the fall and winter terms. Students seeking help should drop into an SVAs office during weekly hours.

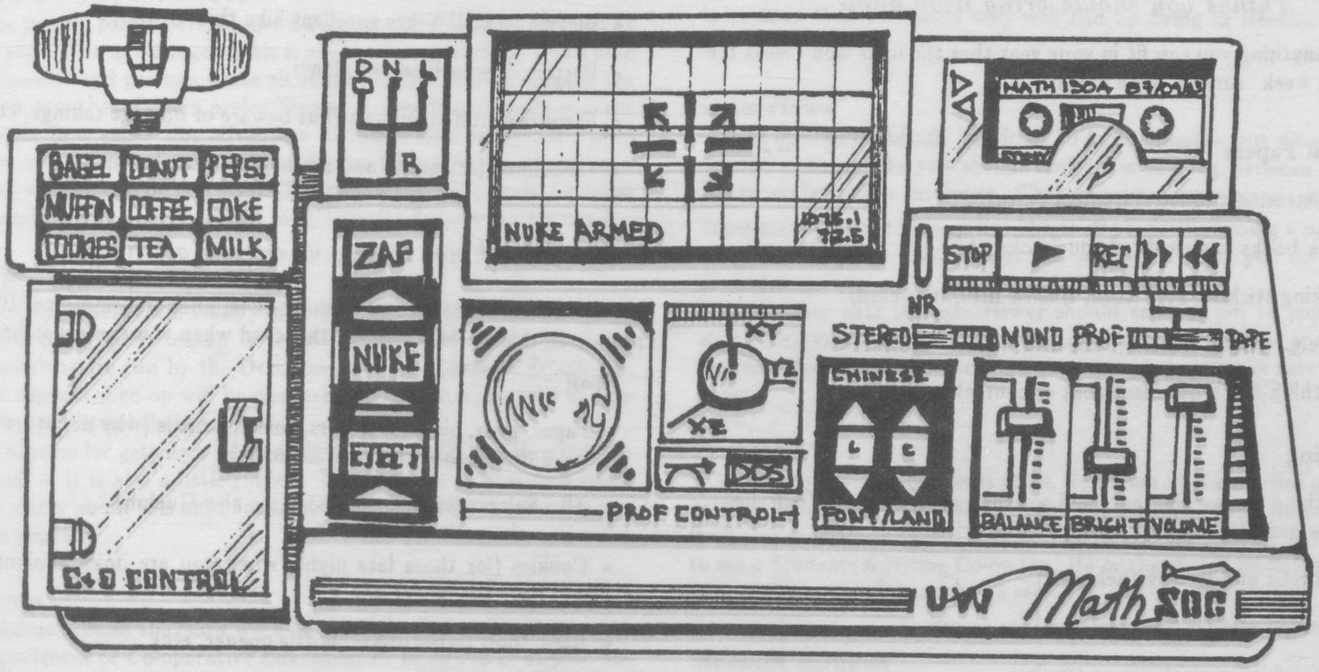
The SVA programme can help students to identify skills and interests, write effective resumes, develop successful interview skills, and plan their career and job search. Visit an SVA and make an investment in your future.



The Prof Control Panel

Mark II

The University of Waterloo will be installing the *new* Prof Control Panel in various desks throughout the university on a trial basis in order to try to improve class attendances. Here is a brief excerpt from the operator's manual accompanying each panel.



Prof Eject Button: For that boring part of the lecture when you just want to send the prof through the roof.

Prof Nuke Button: Similar to the Eject Button but with a more dramatic mushroom cloud effect (usually takes out the first two rows of keeners as well). Radiation suit not included.

Prof Zapper: A quick charge of 500 000 volts can easily tell a prof to get on with the lecture.

Prof Volume: Allows you to sit in the front without shattering your eardrums, or to sit in the back and still hear the prof.

Prof Rewind: Time warp back to an earlier point in the lecture.

Prof Fast Forward: Comes in handy when the class is only halfway through and you're late for dinner.

Prof Brightness Control: To reduce the effect of those fluorescent Friday ties.

Prof Record: Lets you (re)view the lecture in the comfort of your own home. The Panel automatically selects a premium or cheapo tape, based on the quality of the lecture.

Prof Stereo/Mono Switch: Changes professor's voice from a monotonic drone to a high-pitched whine with spurious glitches. If the prof is female, this switch has no effect.

Prof Noise Reduction: Eliminates extraneous proofs, redundant lemmas and useless anecdotes.

Prof Balance Control: Allows the student to adjust the lecture's theory *vs.* practice ratio.

Prof Language Select: Choose one of Chinese, Czech, Farsi, Swahili, Esperanto, Basque or Pidgin English.

Prof Font Select: Choose from a gallery of blackboard fonts: Greek, Hebrew, Zapf 'Dingbats', Bodoni, Old English or Cyrillic.

Prof Gear Selector: Choose 'D' for normal lecturing, 'L' for low-gear grinding through DE's, 'R' for "if and only if" proofs, or 'N' for catching your breath after an exhausting example.

Prof Cruise Control: Set the most comfortable cruising speed for the lecture. We advise setting the speed below the legal limit of 50 (boards per lecture, that is). Failure to do so will void the warranty.

Prof Motion Trac-ball with Plane Control$_{TM}$: Move your prof around in 3-space with an ergonomically designed Trackball and continuously variable oblique Plane Control$_{TM}$. During rougher lectures, drive your prof up the wall; during better ones, help him reach that top blackboard in MC 2065.

Directional Derivative Switch: Used in conjunction with Trac-ball and Plane Control$_{TM}$ to send the prof off on a tangent.

C+D Control: Signal the C+D to beam in the beverage and snack of your choice.

Georg, Vainamoinen and Jordankovic

Survival Kit

As you prepare to venture into unknown territory, you need to know the essentials of life at UW. Besides the obvious (a stereo system of some sort — preferably small but *powerful*) here is a list of items you may find helpful. This list is *not* meant to be comprehensive, only to suggest ideas. Remember, for most of us, it's a long way home!

Things you should bring from home

Well, anything you can fit in your gear that the folks won't miss for at least a week. Among these items:

Official Papers

- Registration and fee statement *(vital)*
- Bank books and cards, chequebooks, etc
- Parking stickers, PAC card, Health Insurance cards
- ID, e.g., driver's licence, SIN card
- *math*NEWS Frosh Issue (but of course)

Clothing

- Clothing for hot weather, cold weather, rainy weather (heh, heh), snow gear if you won't be home 'til Christmas or later
- Umbrella and K-Way (heh, heh)
- Interview clothes (business best) for co-ops
- Sewing kit for quick minor repairs

Other Stuff

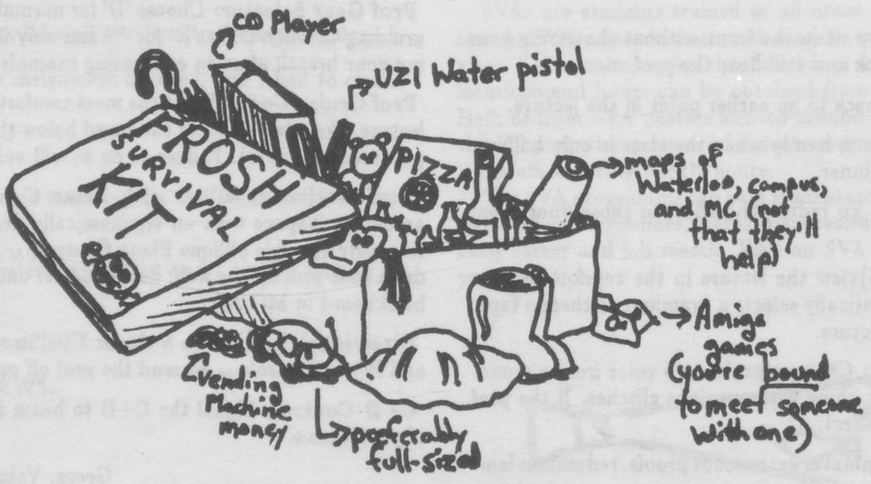
- Money (lots, see articles on money elsewhere)
- Towels, sheets, blankets and pillows
- Small kettle, cups, dishes, cutlery (more for those not getting room and board)
- Alarm clock (unbreakable, with snooze bar for 8:30 classes)
- Toiletry items (enough to last until you buy some here)
- Your bike (UW has excellent bike access)
- Bicycle lock (UW has excellent bike thieves, too)
- Posters, if your landlord allows
- Favourite stuffed animals (but beware of hostage takings, etc)
- Calculator (scientific) and mechanical pencils

Things to buy when you get here

No, we're not getting a cut from the Chamber of Commerce. It's just not worth the hassle of hauling this crud when you can get it here.

Stuff

- Paper, pens, binders, erasers, rulers, pencils (why not start fresh– leave that high school gear at home)
- Alka-Seltzer (see Village Food, see also Guelph)
- Cookies (for those late nights when you are doing assignments, and have the munchies)
- Basic tools (screwdriver, bottle opener, etc)
- Laundry and dish detergent
- Quarters (for laundry, parking, video games, etc)
- Aspirin or equivalent medication
- Bandages



Co-op And You

Welcome to Waterloo, home of one of the best co-operative education programs in North America. This system will be affecting you for the next five years, if you are in co-op.

Stream 4 vs Stream 8

The first big question is just what are the two streams? No matter which stream you choose you will have to do eight straight months of school at some time. An associated question is whether you want to do it during first year or fourth year.

Some people prefer Stream 4, which goes eight months straight in fourth year. The advantage of this is that you start earning your co-op money sooner and you can waste all of your high school earnings in the first four months. Others prefer Stream 8, which goes eight months straight in first year. The advantage to this is that you get it out of the way and when you graduate you have a better chance of getting a job with your last co-op employer. The choice is yours (except for some programs). When it comes down to it, it really doesn't matter much.

COOP 000

This next sentence will teach you everything you need to know about co-op. *Attend your co-op orientation (COOP 000) sessions.* These sessions are run by the Department of Co-operative Education. Various aspects of co-op will be discussed there each week, so it is very important to attend these sessions.

The process for getting a job is really quite simple. For those of you in Stream 4, it is also a little rushed. Those of you in Stream 8 don't have to worry about this until January, but continue reading so you can prepare yourself.

Resumés

Sometime around the third week of September you will have to give the Department of Co-operative Education 20 to 30 copies of your resumé. No late resumés will be accepted. It is a good idea to have your resumé laser printed (no dot matrix printers). You may attach letters of reference, but if it's more than one page then it must be stapled together. No fancy covers or duo-tangs!

Want Ads

The *Want Ads* are probably the biggest classified section you'll ever read. You'll get your copy a few days after you hand in your resumé, probably on a Friday, and you'll have to tell the department what jobs you're applying for a few days later, likely the following Monday. You are not restricted to the jobs in your major, but you may only apply to 20 *Want Ad* jobs. The department will then send your resumé and your high school marks to the employer. For those of you in Stream 8, your high school marks will be sent out in January even though you will have a set of University marks by that time.

Late postings are the job descriptions from companies that didn't make it in time for the *Want Ads*. These will start the day after your *Want Ads* selections are due and are posted on bulletin boards in Needles Hall and the Math building. You may apply for as many of these as you like.

Don't go crazy applying for jobs. A half-decent resumé will net you interviews from half the jobs you apply for. At the time you'll be going through interviews (approx. October 11-November 10) you will be attending classes and writing mid-terms. If you have 10 or 12 interviews then you could very well end up living in Needles Hall for two weeks.

Interviews

The interviews usually last from 20 to 30 minutes, but since they're usually running late you should budget on missing between $1\frac{1}{2}$ to 2 hours of classes per interview. The interviews themselves can be fun. Some students have been quizzed on their proficiency using a particular computer language. So, restrict the amount of lying you do on your resumé.

Remember that the interviewer should sell the job to you as you should sell yourself to the interviewer. You're going to be spending 4 or 8 months of your life working at one company, so make sure you like them.

Problems

If you run into any problems at all, *don't ignore them.* See or call a co-ordinator and get it all straightened out even if you feel stupid doing it. If you can't find your co-ordinator go to the MathSoc office and ask to see a Students Advising Co-op rep. He or she should be able to solve your problem or tell you who to see.

Second Rounds

For those of you that will have the opportunity of going through "second rounds", they can be very tense. You will probably feel that your life is in limbo, since you may not hear from anyone for several weeks. Here are a few words of advice: constantly bother your co-ordinator (bug them two or three times a week); the jobs in second rounds are no worse than the jobs in first round (you have the same chance of getting a good or bad job); don't let the fact that you don't have a job affect your academic performance.

Co-op is a wonderful experience. Jobs are available in places as far away as Seattle, Washington and Atlanta, Georgia. Students have even gone to Australia and Japan. So, you can look forward to all the good times and good people you'll meet on your work terms.

Extra-Curricular Organisations

Campus Rec

Campus Recreation is . . .

- the largest student employer on campus
- full of job and volunteer opportunities
- free to every student
- archery, windsurfing, fencing & kendo, badminton
- co-rec broomball, volleyball, slo-pitch
- competitive basketball, hockey, soccer
- loaded with individual activities
- a place for relaxation, good time, and friendly people
- fun, fun, fun
- yours to enjoy!!!

Get yourself a copy of the campus recreation brochure and be sure to get your term off to a great start!!

Applied Math Club

The name "club" can be misleading. The Applied Math Club is a student run organisation whose main intent is to provide a number of services to applied math undergraduates. The numerous seminars the club presents serve to give students a taste of what is happening in different fields of Applied Math, usually with references to modern research. Every term the club organises a main social event, like the *coffee and tea party* or the annual *summer A.M. barbecue*. It is here that students can discover how exciting it is to work in such a dynamic field with such eccentric and friendly people.

The club has compiled an ENORMOUS file on graduate school information, including descriptions of math departments for most major universities in Canada and the United States. Any third or fourth year student wishing to pursue graduate studies should take advantage of these resources.

Also on file is information on the GRE (the graduate exam required by many American universities) and the Annual Comap Applied Math Modelling Contest.

Watch for posters announcing upcoming seminars and social events, and if you think you help out to ANY degree please drop by the club office, **MC 3031**. It does not take much work to aid something that everyone will be proud of.

FASS

Do you want fun? Do you want frolic? Do you want good times? If your answer to any of these questions is yes, then you want to become a part of the longest running, most outgoing group on campus: FASS.

FASS is made up of Faculty, Alumni, Staff and Students; almost everyone falls into one of these categories. Having so fallen, pick yourself up, dust yourself off and proceed to your local FASS meeting.

Every year FASS members get together to write and perform a musical comedy spoof of life at UW and life in general. It doesn't matter if you have never been in a play before or if you have a terrible case of stage fright or cannot sing a note: FASS has a place for everyone.

FASS needs actors and non-actors. There are a lot of other folks who are part of FASS and are never on the stage. A large support crew is needed to scrounge props at local garage sales, find costume bargains at used clothing stands, build sets and help write the script.

The script has been in the works for five months. Writers' meetings will be approximately twice a week. The call for cast and crew is in the first week of January. The show runs for four nights (five shows) early February to an audience of hundreds.

FASS is calling you. Watch for posters announcing writers' meetings and the general meeting which is held early in the term. Check the Imprint, Gazette, and *math*NEWS Calendars of Events for more details.

Actuarial Science Club

Heading into its fourth term of operations, the Actuarial Science Club is the most happening club on campus. For a mere two dollars, members and others are informed about Actuarial Science. This is especially important for first year students who haven't yet decided on a major.

Various talks and conferences help to keep students abreast of developments in the "real world" and how they affect actuarial science.

Social events have played a large part in the operations of this club. Each term promises a huge bash (open to everyone) following either the writing of the professional exams or upon receiving results.

And last but not least, the Act Sci Club is affiliated with The Actuarial Science National Association. ASNA holds an annual conference and publishes a magazine.

The Act Sci Club office is located in MC3034. Feel free to drop in any time. There's plenty of fun for everyone so be sure to come out and get involved.

Computer Science Club

Greetings, frosh! Welcome to Waterloo, and, by deduction, the Computer Science Club. We are not affiliated with the Sirius Cybernetics Corporation, but plan to be in the near future.

Membership in our illustrious club is open to everyone, no matter what major/department/faculty. All we ask from you is a mere two dollars, in return for which we grant you all sorts of privileges. You can get an account on WATCSC with a userid of your own choosing. From this account you can read news, use email, and play games. We also bring in neat-o wizard speakers, maintain a library of boffo helpful manuals and books on spiffy subjects like fractals, supply all the tea you could possibly want, and generally hang out in the office to answer questions about bogus things like UNIX.

Our office (MC 3037) is located right across from MathSoc, and as we know from past experience, many of you will find us in your search for MathSoc. The third floor of MC isn't completely confusing, just mostly confusing. Anyway, c'mon out. We're the largest club on campus and growing all the time.

The Computer Science Club welcomes you to Waterloo. We're a club for everyone interested in any way in computers. Membership are affordable even to university students, and we provide members with access to our up-to-date library of computer reference books, an account on our Unix minicomputer, a 10% discount at the Computer Book and Supply Centre, and intelligent conversation on almost every topic. Aside from all this, we provide consulting (help) to everyone, members and non-members, who needs it, and we invite interesting people to speak at our meetings, which are also open to everyone. Drop by our office (MC3037, across from MathSoc) anytime, have a cup of tea and become a member!

Other Things

There are many many more clubs on campus that you can get involved in. For those interested in playing games, there are clubs for Scrabble, Chess, Go, and Role-playing games. For those interested in politics there are clubs representing a variety of views from the very radical to the mainstream. As well, there are a host of organisations on campus that you can get involved in, including MathSoc and the Federation of Students.

Whatever your tastes, there is probably something for you! So look around when you arrive. Get involved!

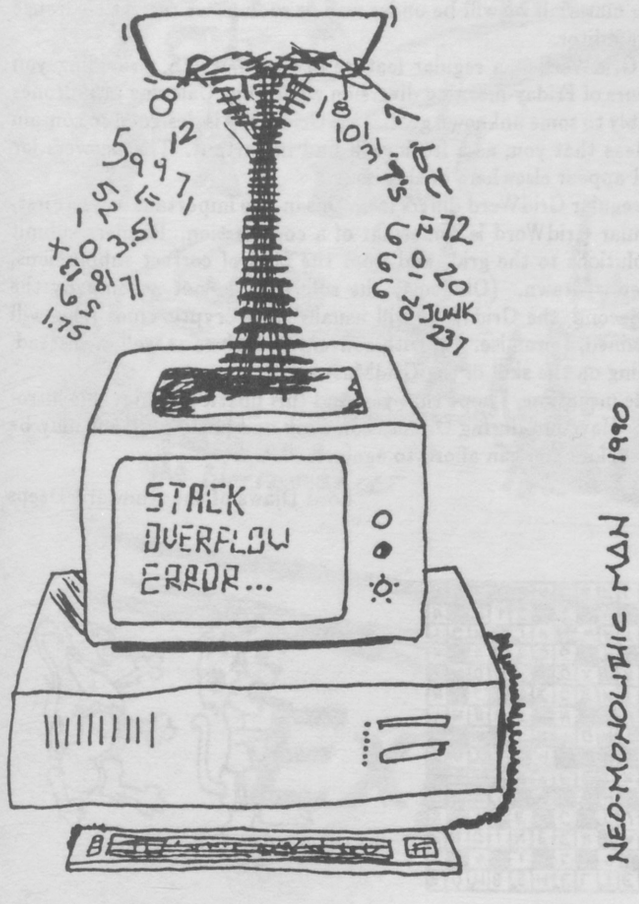
Prof Football

This classroom distraction comes to you from Wilfrid Laurier University where there is a rich football tradition. Perhaps we should modify the rules somewhat and call it Prof Rugby or Prof Basketball to honour our best teams, but then maybe this year will be the big year for our Warriors Football Team ... and maybe it will snow next July!

The only requirement for this game is that it be played in a lecture with a prof who paces. Before the lecture begins, divide the class into two teams. For example, use the aisle in the middle of the room as a dividing line. You must also mark two goal lines at the front of the class. Do this by placing a piece of tape or other marking on the blackboard or front wall about one or two metres in from either side wall. When the prof arrives and the lecture begins, you can start playing Prof Football.

The object is to score a touchdown, which occurs when the prof crosses the goal line in front of your half of the class. The opposing team can try and prevent a touchdown from being scored by attempting to attract the prof to their half of the classroom, and then possibly score a touchdown themselves! The best way to attract the professor's attention is to raise your hand and ask a question. This requires some imagination because the question should be relevant and so must be thought up on the spur of the moment. Watch out though, because asking a lot of confusing questions could make you part of a keener bingo game (see the article elsewhere in this issue.)

It is best to play two twenty minute halves with a ten minute break at half time. This makes for a full fifty minutes of lecture entertainment. So, go out there and win one for the Gipper!



Keener Bingo

You will soon learn that on occasions lectures become, well, less than interesting. For those times when counting ceiling tiles seems more appealing than the Diophantine equation on the board, we present: Keener Bingo.

To begin, we must clarify the definition of a keener. They can easily be spotted in the front rows of any class, where they are noted for their remarkable ability to ask an unusually large number of confusing questions during a lecture. They often bear an uncanny resemblance to characters in "*Revenge of the Nerds*." Standard keener equipment includes: a bulky briefcase, checkered trousers, undershirts and a powerful calculator. Optionally this can be a very powerful calculator such as an HP 41CV with card reader, printer, and optical wand. Other optional keener accessories include: a plastic pocket protector for the front shirt pocket (containing six different coloured pens, several mechanical pencils, a screwdriver and a pencil sharpener), a slide rule, a complete geometry set, and a well-used flowcharting template. Should all this not give them away, keeners tend towards extra long right arms (for better visibility), tape on their glasses, wearing T-shirts or buttons displaying the first 200 digits of π (which they know by heart), and having twice as much stuff in the briefcase as can possibly fit.

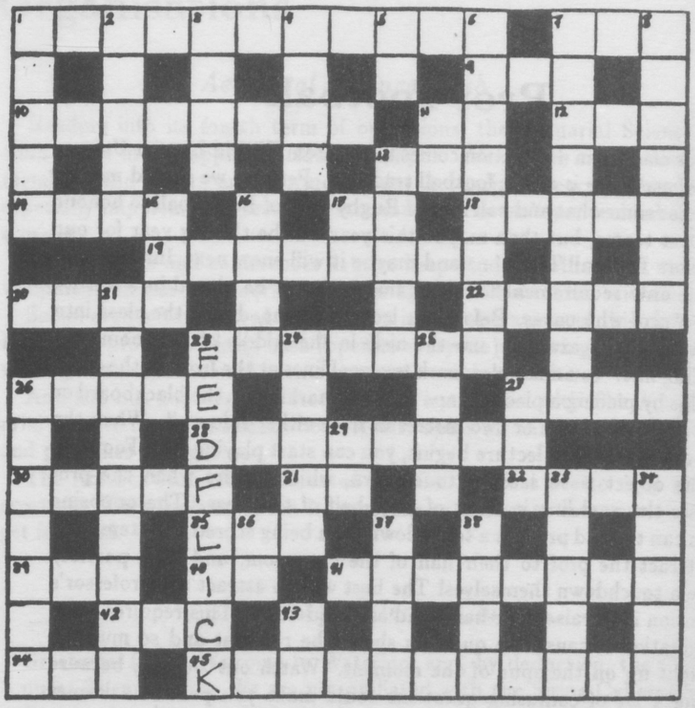
The act of being keen: you will come to be painfully familiar with this procedure. When the prof asks a question, makes a good point, omits something, or even for no reason at all, the keener will thrust his or her hand skyward and attract the prof's attention. This is almost always followed by a vapid and irrelevant question which serves only to confuse the class and often the prof.

The Rules: Pick out three keeners and write their names (class nicknames will do) on a piece of paper. As the keeners are keen, cross off their names. The first person to cross off every keener on their list yells "BINGO" and is awarded one bingo point. Play the game over several classes or several weeks and the winner is the person with the most points at the end of that time. For a more challenging game, arrange the names of nine keeners in a 3 by 3 grid. The winner is the person who first crosses off the names of three keeners in a horizontal, vertical or diagonal row. In both versions, the following rules apply:

- You may not use your own name, nor may you repeat names on the same card.
- An extra point is awarded if you preselected the keeners in the order that they were keen.
- Double score if you can guess their first words, such as "Sir...Sir...", "Professor...", "But...", "Excuuuuse me...", or the always popular "You forgot...".
- Triple points if the prof spots the keener but refuses to acknowledge his or her presence.
- Quadruple points if the prof threatens the keener.
- You are not allowed to physically abuse a keener in order to affect the placement of his or her hand.
- Bribes are illegal.

Before you begin, you may want to have a look at a keener at close range. Pay a visit to the EngSoc Orifice at Carl Pollock Hall. Happy hunting!

GRIDWORD



Across

1. Campus pub (11)
7. Spot on a die (3)
9. Yours will be quickly deflated (3)
10. Lowest known form of vegetable life (8)
11. Wire service (abbrev.) (2)
12. The MacLab uses one (3)
13. Cowardly dog (3)
14. The engineers and mathies each have one (4)
17. One in the batting order (abbrev.) (2)
18. Incompetent, incapable (5)
19. It will enable to finish your work (8)
20. Hindu goddess of destruction (4)
22. An elected representative (5)
23. A small warship (7)
26. To soak or steep (5)
27. Exam preparation technique (4)
28. Final exam month (Fr.) (8)
30. You'll see a lot of these in Calc. and Alg. (5)
31. Member of a yoked team. (2)
32. One of your gods for the next four months (4)
35. Faculty MathScot and well-known function (3)
39. The real name for DavisWorld (abbrev.) (3)
40. Garbage goes here (2)
41. This wonderful metropolitan centre (8)
42. In Latin, thus (3)
44. Foot part (3)
45. Dean of the faculty (11)

Down

1. Many of these will be consumed in frosh week (5)
2. Method by which your profs derive difficult results (5)
3. Ride the wave at this function (4)
4. Particularly slimy engineer subspecie (abbrev.) (4)
5. Home of the Dome (abbrev.) (2)
6. An assignment extension (8)
7. Favourite prof suit fabric (9)
8. Other Faculty MathScot, you'll have to wear one (7)
11. Chemical symbol for gold (2)
13. Students aren't popular in this country (5)
15. Suffix for Hi-Fi and Sky (courses) (3)
16. At a distance (with *from*) (4)
17. From french (2)
21. Your CS course is one (9)
23. A movie shown in AL on the weekend (8)
24. In disguise (fig.) (5)
25. Opus' instrument (4)
26. The campus rag (7)
27. You won't have any of this after an all-nighter (3)
29. The CNE (2)
33. You should be aware of regulations (5)
34. You are one (5)
36. Not off (2)
37. Less than whole (4)
38. It is good and right that you are the least of all. (4)
43. The cave where they keep the engineers. (abbrev.) (2)

Introductory GridComments

GridWord 101

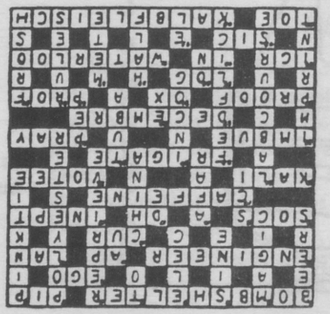
Welcome, frosh, to your $n, n \in \{3, 4, 5, \ldots\}$ year stay at U(W). This is your GridMaster speaking, and if you will please extinguish all smoking material, we will be under way as soon as we receive clearance from the Editor.

The GridWord is a regular feature of *math*NEWS, providing you with hours of Friday-morning diversion while your Calculus prof drones inexorably to some unknown goal. This GridWord is designed to contain some ideas that you, as a frosh, will find important. The answers for the grid appear elsewhere in this issue.

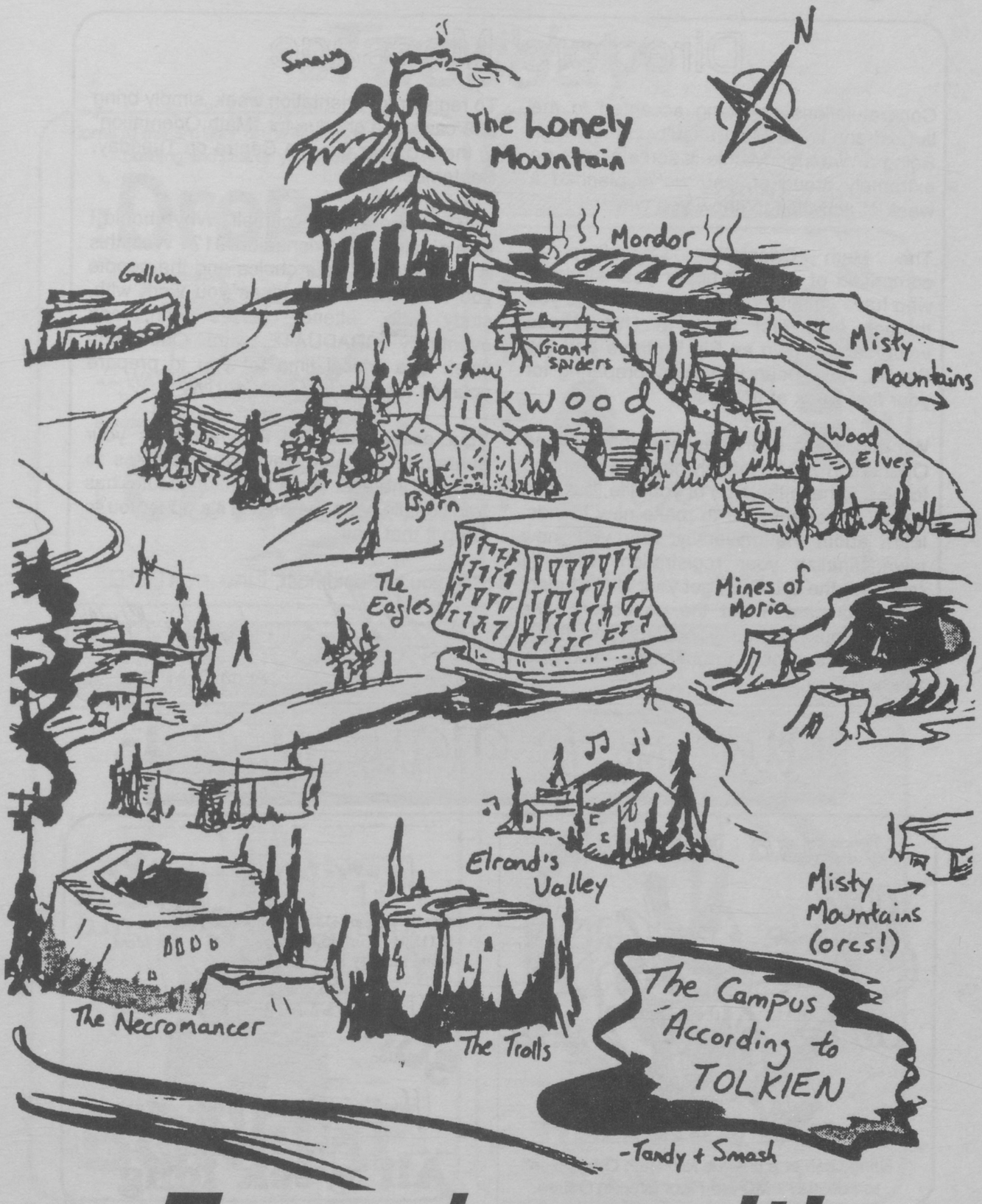
The regular GridWord differs from this in two important ways. First, the regular GridWord is somewhat of a competition. Readers submit their solutions to the grid, and from the pool of correct submissions, a winner is drawn. (Obviously the solutions do not accompany the grid.) Second, the GridWord will usually have cryptic clues (this will be explained, I promise...), with conventional clues as well or instead, depending on the skill of the GridMaster.

In the meantime, I hope that you find this puzzle an enjoyable introduction. Have fun during Orientation week and party hard - it may be a while before you can afford to again.

Lord Djaws of the Rimward Deeps



Math Orientation '91



Experience It!

Directors' Message

Congratulations on being accepted to the largest and finest Math Faculty in the world. Being a Waterloo Mathie is something to be extremely proud of, and we've planned a week of activities to show you why.

The Math Orientation Committee is comprised of over 80 upper year students who have volunteered their time to help you through your first week at UW. These volunteers, known as Big Brothers and Big Sisters, have been very busy preparing for your first week at university.

We encourage every new student to attend Orientation 1991. Not only have we arranged for you to have the time of your life, it is also a very important time to make new friends, learn about the university, tour your new town, finalize your registration, write (if required) the E.L.P.E., get your UW Student Photo ID card, meet the professors, and learn about the many options and major programs available through the Faculty of Mathematics.

To register for orientation week, simply bring $38 cash or a cheque for "Math Orientation" to the 3rd floor Drop-In Centre on Tuesday, September 3rd.

You may be asking yourself "Why should I take part in Math Orientation '91?" Well, this is the faculty of your choice and the people you meet will be the ones you work with, study with, attend classes with, and eventually GRADUATE with! Orientation week is a critical time for you to prepare yourself for your first term at UW.

Your acceptance into this faculty is your guarantee that you have what it takes to succeed here at Waterloo. Our faculty has traditionally been the best -- it's up to you to keep it that way.

See you in September,

Paul A. Salvini Anna Di Minno

Welcome to UW Math!

Bring cash or a cheque for "Math Orientation" to Tuesday's MC 3rd Floor Drop-In Centre.

$$\iiint_T (u\nabla^2 v + \nabla u \cdot \nabla v)\, dV = \iint$$

urticular case of (15.6–4) in w … $= u\nabla v$.
to (15.61–1) or (15.61–2) as *Green's first ident*
second identity is

$$\iiint (\quad - \Delta u)\, dV = \iint_S \left(u \frac{\partial v}{\partial n} - v \frac{\partial u}{\partial n}\right)$$

… tation,

$$\iiint_T (u\nabla^2 v - v\nabla^2 u)\, dV = \iint_S (u\nabla v - v\nabla u) \cdot$$

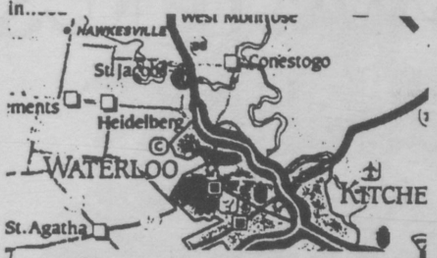
SURVIVAL GAME

All week long

Tuesday

Come to the 3rd floor of the Math & Computer building and pick up your frosh kit.

Drop-In Centre



9:00 a.m. until 12:15 p.m.

FED Playfair

12:30 p.m. - 2:30 p.m.

Discover your Campus

Foot Rally

2:30 p.m. - 4:30 p.m.

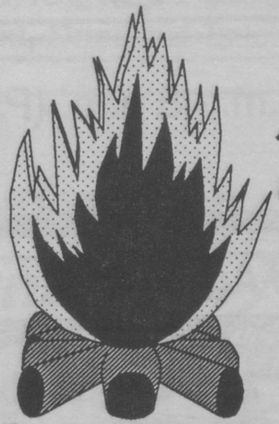
Family Night Out...

Follow your Big Siblings to their favourite place in town.

4:30 p.m.

Columbia Lake

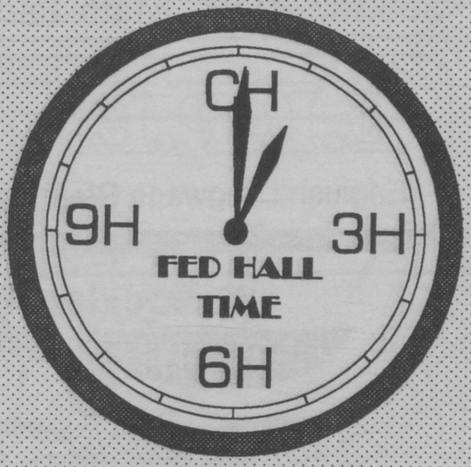
8:00 p.m.



1:00 a.m.

BONFIRE

After Hours Pub



FEDERATION HALL

1:00 A.M. - 3:00 A.M.

Wednesday

MATHEMATICS FACULTY DAY

9:00 - 10:00	Dean's Breakfast (DC Great Hall)
10:00 - 10:30	Advanced Honours Meeting
10:30 - 11:15	Meet your Algebra Professor
11:15 - 12:00	Meet your Calculus Professor
1:15 - 2:00	Meet your Computer Science Professor
2:00 - 2:45	Faculty Information Sessions
3:00 - 4:00	Special Interest Sessions
4:00 - 4:45	Co-op Question Period
5:00 - 6:30	Faculty BBQ (Columbia Lake)
7:00 - 8:00	ELPE (In the PAC)
8:00 - 1:00	Theme Pub (South Campus Hall)

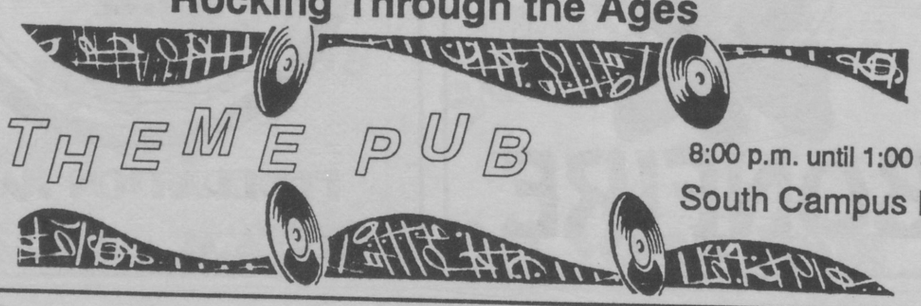
See the PINK Math Faculty Orientation Flyer for details.

E.L.P.E.

7 p.m. - 8 p.m. (PAC)

English Langwage Prafishunce Eggsam

Rocking Through the Ages



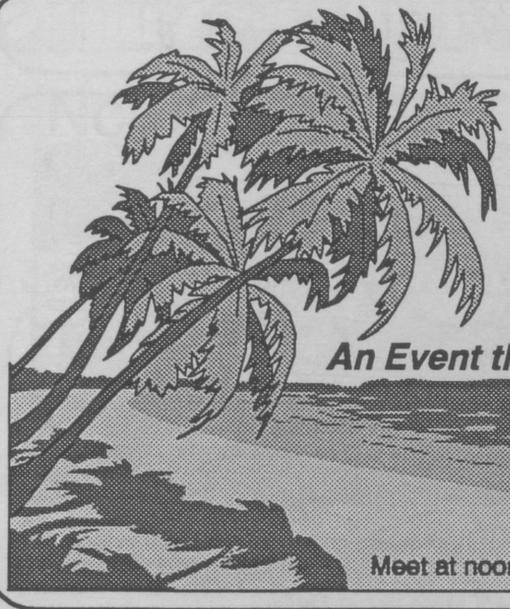
8:00 p.m. until 1:00 a.m.

South Campus Hall

Thursday

University Registration

9:00 a.m. until noon



Waterloo Park

An Event that you won't want to miss.

- Games
- Games
- Prizes
- Food
- Surprises

Meet at noon on the 3rd floor of the Math Building.

PAC Patio

Food, Drink and Entertainment from the Feds.

5:00 p.m.

Scavenger Hunt Begins...

7:00 p.m.

Register on 3rd floor of MC.

Friday

SCAVENGER HUNT JUDGING

Sleep!

You'll need it.

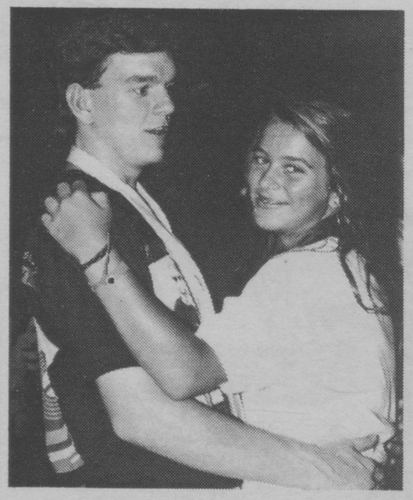
BINGEMAN PARK

- GoCarts
- Waterslides
- Bumperboats
- Mini Golf
- Wave Pool
- Hot Tub
- Free Food!
- More ...

Meet at the Math Loading Dock at noon.

QUESTION: Who holds the record for "most people in the Adult Therapy Pool at Bingeman's"?

ANSWER: UW Math (97 in 1989)



Bingeman Park Dance

Doors open at 8:00 p.m.

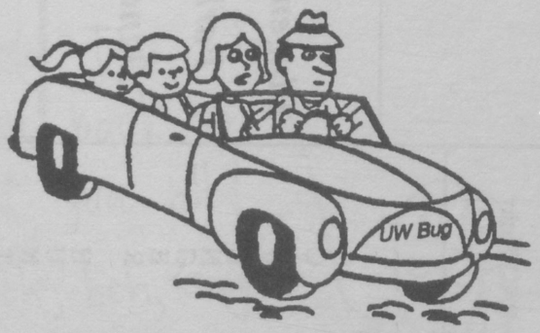
Saturday

Raise money for Cystic Fibrosis research at

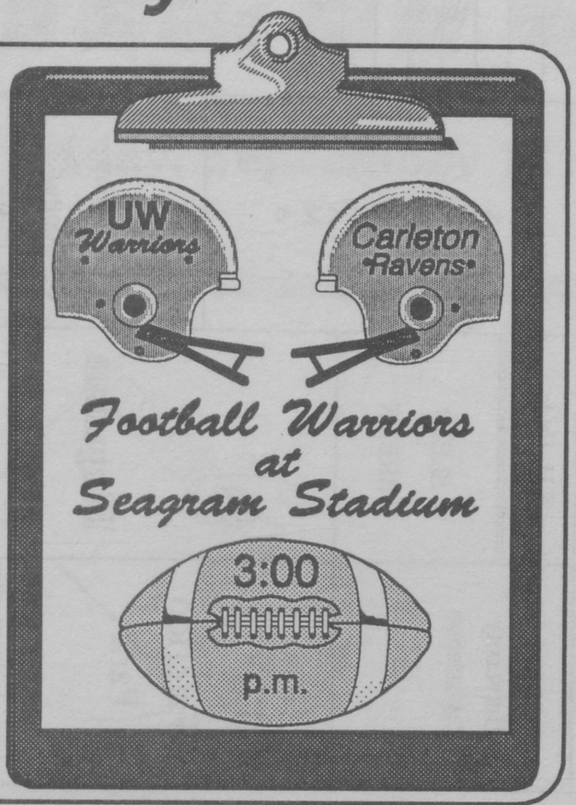
SHINERAMA

North Waterloo

Buses leave by 8:30 a.m.



HELP YOUR FACULTY SHINE



Casino Night

8:00 p.m. - 1:00 a.m.

FEDERATION HALL

Math Orientation 1991 Schedule

	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
8:30	Math Building Tours and Parent Reception	*Drop-In Centre*	FACULTY DAY	University Registration	S.H. Ends	SHINERAMA	
9:00							
9:30					SLEEP BREAK		
10:00							
10:30							
11:00							
11:30							
12:00							
12:30		FED Playfair		Waterloo Park	Bingeman Park		Movies at Fed Hall
1:00							
1:30							
2:00						Warriors Football at Seagram Stadium	
2:30		Foot Rally					
3:00							
3:30							
4:00							
4:30		Family Night Out					
5:00			Faculty BBQ	PAC Patio			
5:30							
6:00							
6:30							
7:00			E.L.P.E.	SCAVENGER HUNT			
7:30							
8:00			Theme Pub at South Campus Hall		*Bingeman Park Dance*	Math & V1 Sponsored Casino Night	Comedy Night at Fed Hall (tentative)
8:30							
9:00							
9:30							
10:00							
10:30							
11:00		Columbia Lake Bonfire					
11:30							
12:00							
12:30							
1:00		Fed Hall After Hours PUB					
1:30							
2:00							
2:30							